Final
Site Investigation Report for Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the United States for Eielson Air Force Base, Fairbanks North Star Borough, Alaska

February 2015

Submitted to:

Air Force Civil Engineer Center
2261 Hughes Avenue, Suite 155
Lackland Air Force Base, Texas 78236-9853

Submitted by:

U.S. Army Corps of Engineers
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Prepared by:

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under

Contract No. W912HN-12-D-0021
Delivery Order No. 0007

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Acronyms and Abbreviations

µg/kg	microgram per kilogram
µg/L	micrograms per liter
AFCEC	Air Force Civil Engineer Center
AFFF	aqueous film forming foam
AMSL	above mean sea level
bgs	below ground surface
BTOC	below top of casing
CAS	Chemical Abstract Service
CCL	Contaminant Candidate List
DOT	Department of Transportation
DPT	direct push technology
EAFB	Eielson Air Force Base
EAI	Emerald Alaska, Inc.
EPA	United States Environmental Protection Agency
ERP	Environmental Restoration Program
gpm	gallons per minute
IDW	investigation-derived waste
J	estimated value
NL	not listed
PFC	perfluorinated chemical or compound
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
pH	potential of hydrogen
PHA	Provisional Health Advisory
PWS	public water system
QAPP	quality assurance project plan
RCRA	Resource Conservation and Recovery Act
RSSL	Residential Soil Screening Level
SCF	SES Construction and Fuel Services LLC
SOW	scope of work
SVOC	semi-volatile organic compound
TA	TestAmerica
TCLP	toxicity characteristic leaching procedure
U	analyte not detected at Method Detection Limit
UCMR	unregulated contaminant monitoring rule
USACE	United States Army Corps of Engineers
USAF	U.S. Air Force
VOC	volatile organic compound

1. INTRODUCTION

SES Construction and Fuel Services LLC (SCF) under contract to the U.S. Army Corps of Engineers (USACE) Savannah District (Contract No. W912HN-12-D-0021, Delivery Order No. 0007) has conducted screening-level site investigations at various U.S. Air Force (USAF) facilities in the United States. These site investigations were conducted to determine the presence or absence of perfluorinated compounds (PFCs) in the environment at the sites.

PFCs are a class of synthetic fluorinated chemicals used in many industrial and consumer products, including defense-related applications. In 1970, USAF began using aqueous film forming foam (AFFF), firefighting agents containing PFCs, to extinguish petroleum fires. AFFF may contain perfluorooctane sulfonate (PFOS), and some PFC-based AFFF constituents may further degrade into perfluorooctanoic acid (PFOA). Releases of AFFF to the environment routinely occur during fire training, equipment maintenance, storage, and use. PFOS and PFOA were included on the U.S. Environmental Protection Agency's (EPA) third Contaminant Candidate List (CCL). The CCL is a list of contaminants not subject to any national primary drinking water regulations, that are known or anticipated to occur in public water systems (PWSs), and that may require regulation under the Safe Drinking Water Act. Six PFCs, including PFOA and PFOS, are listed in the EPA Proposed Unregulated Contaminant Monitoring Rule (UCMR). The rule would require PWSs to monitor for these chemicals from 2013 through 2015. The UCMR is the primary source of occurrence and exposure information the EPA uses to determine whether to regulate a contaminant. EPA also used data collected from toxicity studies on monkeys and rats to derive an interspecies correction factor to develop provisional health advisories (PHAs) for PFOS [0.2 micrograms per liter (µg/L)] and PFOA (0.4 µg/L) to protect humans against potential risk from exposure to these chemicals through drinking water. Additionally, EPA Region 4 calculated Residential Soil Screening Levels (RSSLs) for PFOS [6,000 micrograms per kilogram (µg/kg)] and PFOA (16,000 µg/kg) using the Superfund program's risk-based Regional Screening Level calculator. Although manufacturers have reformulated AFFF to eliminate PFOS, the EPA continues to permit the use of PFOS-based AFFF, and the USAF maintains a significant inventory of PFOS-based AFFF product.

The investigations for this project were conducted to determine whether PFCs were present at the selected USAF facilities, and if so, at what concentrations. The goal was not to determine the nature and extent of contamination but to determine whether further investigation is required based on the presence of PFCs and their relative concentrations. In addition, materials used by the general public are potential sources for the release of PFCs to the environment. This study was intended to determine only the presence or absence of PFCs at the selected sites and was not intended to differentiate between releases from facility operations from other potential sources. In addition, the USAF assumes that fire training areas are likely to be contaminated with PFCs because of the history of AFFF use, and these sites will be evaluated under a separate program.

Sample media evaluated at each site included surface/subsurface soils (vadose zone in the source area), groundwater (from existing monitoring wells), and surface water/sediment (if applicable). The methods of sample collection and laboratory analysis met a minimum level of quality and completeness to achieve comparability across the sites and over time. A generic quality assurance project plan (QAPP) (SCF, November 2013) was prepared in accordance with EPA guidance (EPA, March 2012) and Air Force Civil Engineer Center (AFCEC) protocols. The standard operating procedures and protocols used in this investigation were derived from or were in accordance with EPA guidance documents. Field sampling plans in the form of addenda to the project QAPP were generated for each facility detailing the activities to be conducted at the selected sites.

This site investigation report details the activities conducted at Eielson Air Force Base (EAFB), Fairbanks North Star Borough, Alaska. EAFB is in the southeast portion of Alaska, approximately 20 miles

southeast of Fairbanks. Figure 1 (Appendix A) shows the location of EAFB. SCF personnel conducted a site reconnaissance on April 2 and 3, 2014, to identify potential PFC usage areas and to select sites for further evaluation. A total of 10 sites were identified as potential PFC source areas based on information provided by the Environmental Restoration Program (ERP) office, site operational history, known or potential release of materials containing PFCs at the sites, and interviews with personnel from base operations, the EAFB fire department, stormwater management, and AFFF systems maintenance. The 10 sites were ranked based on potential for PFC contamination, and logistical access.

- South Ramp Spray Test Area – Spray pattern tests were performed after 1980s on Taxiway H. Priority Ranking = 1. Potential for PFC is high. Logistical issues include access to active taxiway and underground utilities.
- KC-135 Fire – AFFF was used to extinguish a KC-135 fire on the apron directly north of Taxiway C in 1989. Priority Ranking = 2. Potential for PFC is high. Logistical issues include access to active taxiway and underground utilities.
- Former Ball Field Spray Test Area – Spray pattern tests performed on an old ball field north of Fire Station #1 (Building 1206) in the 1980s. Priority Ranking = 3. Potential for PFC is high. Logistical issues include access to active taxiway and underground utilities.
- Garrison Slough – Entire base uses sheet flow and permitted injection wells to manage its stormwater with Garrison Slough as the main stream to possibly remove sheet flow that doesn't evaporate. Priority Ranking = 4. Potential for PFC is high. Logistical issues include underground utilities.
- Foamed Runway – The entire runway was foamed with AFFF in preparation for the landing of a KC-135 with possible stuck landing gear. Priority Ranking = 5. Potential for PFC is high. Logistical issues include access to active taxiway and underground utilities.
- Building 1348 Paint Booth – Foam residue was found in wet fire suppression system piping. No known release. Priority Ranking = 6. Potential for PFC is low. Logistical issues include access to the building and underground utilities.
- Building 1171 – AFFF was accidentally released from a sprinkler in the mechanical room. It is supposed to be a wet system, but a small amount of foam was found on floor after the release. Priority Ranking = 7. Potential for PFC is low. Logistical issues include underground utilities.
- Ten AFFF Hangars – Ten hangar buildings have AFFF fire suppression systems. No AFFF system personnel have been at Eielson AFB more than three years, so there is limited knowledge of testing or release history. They knew of no releases from the hangars. They plan to perform system tests sometime this summer. Priority Ranking = 8. Potential for PFC is low. Logistical issues include underground utilities.
- Former Fire Training Area – AFFF was used in training exercises. The facility is unlined. Priority Ranking = 9. Potential for PFC is low. Fire training areas were not eligible for investigation as part of this project.
- New Fire Training Area – AFFF was used in training exercises. The facility is lined. Priority Ranking = 10. Potential for PFC is low. Fire training areas were not eligible for investigation as part of this project.

The four top ranking sites were selected for additional investigation to determine if PFCs were present in the environment, and if so, at what concentrations. These four sites were chosen for additional investigation:

- Site 1 – South Ramp Spray Test Area;
- Site 2 – KC-135 Fire;
- Site 3 – Ball Field Spray Area and Garrison Slough; and
- Site 4 – Foamed Runway.

The four selected sites had confirmed or suspected releases of PFC-containing materials, and could be accessed with minimal impact to base operations.

2. ENVIRONMENTAL SETTING

The following regional and base-specific information is taken from the *Draft Conceptual Site Model for Eielson Air Force Base, Alaska* (AECOM, May 2013).

2.1 SURFACE WATER

Garrison Slough is the primary surface water pathway for runoff at EAFB. Surface water runoff is drained by surface sheet flow across EAFB and evaporates or ultimately drains to Garrison Slough. Garrison Slough flows off of EAFB north into wetlands that eventually flow into the Tanana River.

2.2 GROUNDWATER

2.2.1 Regional Hydrogeology

Much of Alaska is underlain by bedrock, and Quaternary sediments accumulate only in stream valleys. EAFB is in the Tanana Basin in the valley of the Tanana River, bordered on the north by the Yukon-Tanana Upland, which is characterized by rolling hills and small mountains, and the Alaska Range to the south. In this area, Quaternary sediments consisting of loess are found on the low hills and lower slopes, some of them reworked and redistributed downslope, and of alluvium found on the valley bottoms.

The consolidated rocks in the area of EAFB are part of the Birch Creek Schist of Precambrian age. This unit is primarily slaty to schistose although it includes quartzite and quartz veins (Cederstrom, 1963). The schist weathers to silt and clayey silt. The weathering product has been described as yellow clay in drill logs. The weathering zone may be relatively thick, 150 feet or greater. These rocks were folded and metamorphosed, folded again during the Middle Tertiary, then eroded until a mature landscape developed. During the Pliocene, these rocks were uplifted, and more erosion took place, depositing auriferous gravel in some areas. Because thick sediment accumulations are present in the Tanana Basin, bedrock is several hundred feet deep in the middle of the valley. The alluvium is thin or not present on the hill slopes, and in these areas, bedrock may be at or near the ground surface.

The term Birch Creek Schist has been used for all older Precambrian metamorphosed sedimentary rocks consisting primarily of quartzite, quartzite schist, quartz-mica schist, mica schist, feldspathic and chloritic schists, minor carbonaceous and calcareous schist, and crystalline limestone (Cederstrom, 1963). Rocks exposed on the slopes and hills of the Yukon-Tanana Uplands range from amphibolite to green schist facies. They have been referred to as the Quartz and Pelitic Schist of the Yukon-Tanana Upland and correspond to the Fairbanks Schist of the Fairbanks Mining District (Wilson and others, 1998; Meyer, 2008).

Sedimentary deposits overlie the Birch Creek Schist in much of the area surrounding EAFB. In geologic history, glacial ice to the south advanced toward the Tanana River. The most recent glaciation was during the Late Pleistocene (Wisconsinan glaciation). During the maximum glaciation, the ice sheet advanced nearly to the Tanana River. During glacial retreat, outwash and alluvial fans were deposited to the south and west of the river. The prevailing wind direction appears to have been from the west, blowing silt-size particles from the alluvial fans and plastering them on the hill slopes of the Tanana Uplands. These loess deposits accumulate predominately during colder climates. This glacial environment created extreme changes in surface-water flow rates: high flow created by melt water and low flow when no melt water

was available. As a result, the Tanana is braided with multiple channels that wander across the valley, leaving abandoned channel belts. These sedimentary deposits are discussed in more detail in the following paragraphs.

Loess has been deposited on the hill slopes to the east of EAFB. Known as the Fairbanks Loess, this deposit consists of tan to grayish-tan silt (Pewe, 1975). It is well sorted and massive with little jointing or stratification. The Fairbanks Loess is thickest near major rivers draining glaciated areas. It is thin or absent on the highest hilltops but thickens downslope. This silt has been reworked and redistributed farther downslope and on the valley floor in some areas. The Fairbanks Loess is thought to span the Illinoian, Wisconsinan, and Holocene glaciation events.

Along the hill slopes and underlying the loess are sediments deposited by solifluction, which is the slow, downslope movement of soil saturated with melt water. Occurring in periglacial settings, melting during the warm season leads to water saturation in the thawed surface soils, in this case loess. Frost heave and small-scale slippage rework and redistribute the sediment downslope. Weathered bedrock fragments may be included in the reworked material. This solifluction layer is widespread, inactive, and has been referred to as the Tanana Formation (Pewe, 1975).

The ground in the Fairbanks area was frozen to a considerable depth in Pleistocene and recent time. Today, perennially frozen ground is not usually continuous over wide areas on the valley floor. The thick masses of permafrost (where present) may thin laterally, either gradually or abruptly, generally where a stream or the course of a former stream is approached. Where thick permafrost has been penetrated by wells in Fairbanks, the mass is ordinarily solid, and apparently unfrozen layers are absent. Near the edge of the frozen mass, however, lateral melting at different rates has produced a saw-tooth pattern in cross-section.

The seasonal freezing and thawing often referred to as the thermal cycle produces ice wedges. During the freezing part of the cycle, thermal contraction causes cracks at the ground surface that fill with snow and ice. Numerous cracks can develop, forming a polygonal pattern. During the thawing part of the cycle, the ice within these cracks does not completely melt. Over many thermal cycles, these cracks become larger and deeper. As the volume of ice expands, the ice wedges can become interconnected. If because of changed conditions, the ice melts, the spaces left from the ice wedges fill with silt and clay, forming ice-wedge casts. The ice wedges and casts can be several feet wide and 12 feet deep. In either case, they can divert shallow groundwater flow. Over time, networks of ice-wedge casts filled with low permeability material may be associated with a paleo-soil horizon and covered with several feet of more modern sediment.

The valley-fill deposits of the Tanana Basin are complex and heterogeneous, consisting of alternating sand, gravel, and silt (Cederstrom, 1963). These braided river deposits are composed of variable gradations of fine and coarse material. Generally, individual lenses are less than 20 feet thick. Many structures found in these deposits are small scale and cannot be correlated over great distances. Permafrost is present in many areas.

EAFB is in the area of an abandoned river-channel belt, and the subsurface underlying most of the Base consists of braided river deposits. These deposits are complex in structure but similar in lithology. In the Tanana River Valley, they are 300 feet thick or greater. In the developed part of the Base, fill material, generally described as silty sand and gravelly sand, was used during construction. This material was quarried nearby and is lithologically similar to natural soil although the sedimentary structures would have been obliterated. Only the upper part of the floodplain sediments has been explored, in some areas less than 30 feet. These sediments consist primarily of gravelly sand and sandy gravel (AECOM, May 2013).

2.2.2 Local Hydrogeology

The sediments within the Tanana Basin provide large quantities of water to wells. The characteristics of the water-bearing units in the area are discussed in the following paragraphs. Figure 2 (Appendix A) presents a generalized hydrogeologic section for the EAFB area.

The Birch Creek Schist underlies the unconsolidated, sedimentary deposits in the vicinity of EAFB. However, the unconsolidated deposits do not extend far up the hill slopes. Water-supply wells in these areas tap into the schist. The schist is an inferior water-bearing formation, seldom yielding more than 10 gallons per minute (gpm); therefore, this unit is considered an aquitard. Of more significance in terms of well yield are the sediment-filled valleys along the mountain slopes. These valleys are commonly underlain with sand and gravel, and wells drilled into these deposits may yield 100 gpm or more (Cederstrom, 1963).

By contrast, the sands and gravels underlying the Tanana River Valley (braided river deposits) provide large quantities of water (1,000 gpm or more) to wells. This unit has been called the Tanana Basin Aquifer. Well yields of up to 3,400 gpm with minimal drawdown have been reported. Recharge is predominantly from seepage into the aquifer from stream beds during periods of melt water rather than from precipitation. During these times, the river elevations are higher than the groundwater levels.

Groundwater flows down the hill slopes within the Birch Creek Schist and the sediments of the valley fills toward the basin. Initially, the groundwater in the upland areas is under unconfined conditions. Along the flow paths, permafrost is encountered in the silt deposits above the schist, and the groundwater becomes confined, often under flowing artesian conditions. Once in the valley, groundwater is again unconfined. Wetlands are present along the valley floor near the foot of the uplands, which may be fed by groundwater moving down the fill slopes. Shallow groundwater flow within the Tanana Basin Aquifer corresponds to the direction of stream flow, to the northeast. In some areas the local flow directions may vary because of recharge/discharge conditions in the area. Near Fairbanks, the water level in the Tanana River is higher than in the Chena River to the north. Because of river-stage elevations, groundwater flow is from the Tanana River, a groundwater recharge area, to the Chena River, which is a discharge area. The deep groundwater flow direction is thought to follow this pattern, moving from the Tanana River to the Chena River all year, rather than parallel to the river flow.

Recharge to the Tanana Basin Aquifer is from precipitation, snow melt, and infiltration from stream beds. Historic water-level data indicate that recharge typically increases from April through May, often beginning in late March and continuing through mid-June, indicating recharge from snow melt and from high water levels in the rivers and streams. Water-level declines begin in July or August. The largest recharge to the aquifer is from the river during periods of high flow. During these times, the Tanana River is a losing stream whereas during periods of low flow, the river is a gaining stream and groundwater discharges to the river. The tributaries flowing from the uplands and across the alluvial fans to the southwest are also losing streams; during periods of low flow, many of them disappear before reaching the river. There is also recharge from the Birch Creek Schist from groundwater flowing down the hill slopes to the valley. The wetlands at the foot of the uplands, to the east of EAFB, are likely fed from this source and precipitation perched on permafrost. Therefore, the wetlands may also lose water to the Tanana Basin Aquifer. The water within the Tanana Basin Aquifer is a calcium bicarbonate or calcium magnesium bicarbonate type. The water quality is highly variable, suitable for most uses in many areas but locally contains high iron and manganese and may not be usable for drinking water without treatment.

Water levels in the Tanana Basin Aquifer vary seasonally, rising during snowmelt and declining in winter. During this cycle, the Tanana River loses water to the aquifer, but as the season progresses and river levels decline, it begins to gain water. AECOM measured the water levels during September, which

is in the middle of this cycle. Analysis of river stage elevations compared with groundwater levels indicates there is little separation between the two, less than 0.2 feet although data is limited. Based on these data, the sloughs at or near EAFB are likely to be at the same elevation as the groundwater and for this interpretation, the sloughs are not shown influencing the groundwater contours. EAFB is surrounded by wetland areas. On the eastern side of EAFB, these wetlands likely recharge groundwater. The groundwater flows downslope from the hills, discharges into the valley sediments, and creates these wetlands.

In general, groundwater flow is to the north-northwest, turning more westerly to the north, paralleling the sloughs. This parallel flow pattern indicates that the overall groundwater flow is more influenced by aquifer boundaries than the tendency to receive recharge from or discharge to the sloughs. The aquifer is bounded by lower permeability schist and alluvial fans. These features act hydraulically as no-flow boundaries though a small amount of groundwater is present in both. This hydraulic boundary effect is the result of the contrast in permeability, the schist and alluvial fans being low, and the braided river deposits being very high. Therefore, the shape of the valley controls the overall direction of groundwater flow. However, local perturbations in the contours created by changes in river stage may occur.

Alluvial fans fine toward their distal ends. These fan deposits are typically much finer than the braided river deposits encountered at the Base, causing the boundary effect. However, the thickness of the alluvial fans is unknown. It is likely that at least a portion of the fans have pushed out over older braided river deposits. If this is the case, the groundwater flow direction in the deep part of the aquifer could be more westerly than the shallow flow direction.

The Tanana Basin Aquifer is composed of a heterogeneous mixture of gravelly sands and sandy gravels. Although very permeable, this heterogeneity causes local changes in groundwater flow velocity. Groundwater depths range from the ground surface in wetland areas to 10 feet below ground surface (bgs) in developed areas of EAFB. If contaminants were released in this environment, they would tend to migrate relatively slowly through the fill material near the ground surface and very rapidly in the aquifer sediments. The plume shapes would likely be complex because of the changes in groundwater velocity on the scale of the bed forms encountered in braided river sediments. Along the flightline the hydraulic gradient varies, but over a 3,750-foot distance, a decline in head of 4 feet was observed, yielding a gradient of 0.0011. Using this gradient, a hydraulic conductivity of 240 feet per day [based on a transmissivity of 800,000 gallons per day per foot (Cederstrom, 1963)], a 450-foot thickness, and a porosity of 0.3, groundwater would flow approximately 320 feet in one year. However, it is likely that the groundwater velocity is highly variable (AECOM, May 2013).

2.2.3 Potentiometric Surface

Previous reports indicated that the unconfined groundwater flow beneath EAFB is generally to the north-northwest with localized changes in flow from variability in the aquifer material. During the current AFFF investigation, initial groundwater measurements were collected prior to sampling existing wells at each site. The elevations of the potentiometric surface developed from the limited number of data points at each site generally matched the basewide potentiometric surface and groundwater flow direction as described in the previous reports. Table 1 (Appendix B) contains the initial depth to groundwater measurements for the sampled wells.

3. SITE DESCRIPTIONS AND OPERATIONAL HISTORY

The following sections describe the use and/or mechanism of release for PFCs at the selected sites. Figure 3 (Appendix A) presents the relative position of the four sites selected for further investigation within EAFB.

3.1 SITE 1 – SOUTH RAMP SPRAY TEST AREA

The South Ramp is at the south end of the runway complex of EAFB. Taxiway H runs along the northeast side of the ramp, and Taxiway J runs along the southwest side of the ramp. The EAFB fire department has used the paved area of the ramp since the 1980s to perform spray pattern testing on its firefighting equipment. Periodic tests to certify that the spray system on each truck meets minimum performance standards are reportedly conducted on the ramp. These tests consist of spraying a foam mixture onto the pavement of the tarmac and determining the density of foam at measured distances and spray angles from the truck. The investigation focused on soils in the grass-covered areas directly adjacent to the northeast and southwest sides of the paved ramp area and the shallow groundwater beneath the site.

3.2 SITE 2 – KC-135 FIRE

In 1989, while shutting down the engines in a KC-135 Stratotanker, an overheated fuel pump exploded causing a fire in the aircraft. An unknown quantity of AFFF was used to extinguish the fire. The incident occurred on the aircraft parking apron just north of the intersection of Taxiway C and Taxiway F. The investigation focused on the soils in the grass-covered areas on each side of the parking apron and the shallow groundwater beneath the site.

3.3 SITE 3 – FORMER BALL FIELD SPRAY TEST AREA/GARRISON SLOUGH

In the 1980s, the EAFB fire department reportedly performed multiple AFFF spray pattern tests in an old ball field north of and adjacent to Fire Station #1 (Building 1206). Anecdotal information indicates that the AFFF may have spread beyond the ball field area. A significant portion of surface water runoff at EAFB enters Garrison Slough. A section of Garrison Slough, including Garrison Slough Pond, is in the surface flow pathway, approximately 950 feet south and east of the former ball field area. The investigation focused on the soils in the grass-covered area of the former ball field, the shallow groundwater beneath the site, and the surface water/sediment where surface water flow from the former ball field enters Garrison Slough.

3.4 SITE 4 – FOAMED RUNWAY

The North-South runway (Runway 14/32) was foamed with AFFF as a precautionary measure when a KC-135 was preparing to land with potentially disabled landing gear. The landing gear operated correctly, and the aircraft landed without incident. The investigation focused on the soil in the grass-covered areas adjacent to both sides of the runway immediately north of Taxiway B and the shallow groundwater beneath the site.

4. SAMPLING ACTIVITIES

SCF personnel mobilized to EAFB on July 28, 2014, to conduct field sampling operations. Prior to mobilization, a readiness review was conducted to verify that all personnel and equipment were prepared to safely and efficiently conduct the sampling activities.

SCF was tasked with collecting 10 samples per site to determine the presence or absence of PFCs in the environment. The anticipated number of samples, per media at each site, as detailed in the project scope of work (SOW) (USACE, April 2013) were

- Three groundwater samples,

- Four subsurface (vadose zone) soil samples within the source zone, and
- One surface water and two sediment samples if applicable to the site.

The SOW also stated that the number of samples per media could be adjusted based on site conditions. All samples collected during this field effort were submitted to TestAmerica (TA) of Denver, Colorado, an accredited laboratory under the Department of Defense Environmental Laboratory Accreditation Program. Water samples were analyzed using EPA Method 537, *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/ Tandem Mass Spectrometry, Version 1.1* (EPA/600/R-08/092, September 2009). TA has developed modified versions of this method for solid samples, and these modified methods were used to analyze the soil and sediment samples.

The samples were analyzed for the following 16 parameters.

Analyte	***CAS Number**
• Perfluorooctane sulfonate (PFOS)	1763-23-1
• Perfluorohexane sulfonate (PFHxS)	108427-53-8
• Perfluorooctanoic acid (PFOA)	335-67-1
• Perfluoroheptanoic acid (PFHpA)	375-85-9
• Perfluorononanoic acid (PFNA)	375-95-1
• Perfluorobutane sulfonate acid (PFBS)	29420-43-3
• Perfluorobutanoic acid (PFBA)	375-22-4
• Perfluorodecane sulfonate (PFDS)	67906-42-7
• Perfluorodecanoic acid (PFDA)	335-76-2
• Perfluorododecanoic acid (PFDoA)	307-55-1
• Perfluorohexanoic acid (PFHxA)	307-24-4
• Perfluorooctance sulfonamide (PFOSA)	754-91-6
• Perfluoropentanoic acid (PFPA)	2706-90-3
• Perfluorotetradeconoic acid (PFTeA)	376-06-7
• Perfluorotridecanoic acid (PFTriA)	72629-94-8
• Perfluoroundecanoic acid (PFUnA)	2058-94-8

*CAS = Chemical Abstract Service

Soil Samples

Surface soil samples (0 to 0.5 feet bgs) were collected directly from the surface soils into the sample container using precleaned stainless steel spoons. Subsurface soil samples (deeper than 1 foot bgs) were collected at the first water-saturated zone of soil using a macrocore sampler from soil borings installed with a Geoprobe™ direct push technology (DPT) drilling rig. Soil boring logs are in Appendix C.

Groundwater Samples

Groundwater samples from existing wells were collected by inserting polyethylene tubing to the depth of the screened interval of the well and connecting the tubing to a peristaltic pump. Water was purged from the well until groundwater quality parameters stabilized. Groundwater samples at locations without existing monitoring wells were collected from 1-inch diameter stainless steel slotted well screens installed by the DPT drilling system to the total depth of the boring. Disposable polyethylene tubing was inserted into the temporary well screen and connected to a peristaltic pump. At the completion of sampling activities, the well screens from the DPT temporary well points were removed and the boreholes filled with bentonite chips to the surface. All groundwater samples were collected from the discharge side of the pump directly into the sample containers.

Sediment Samples
Sediment samples were collected using stainless steel spoons and/or a decontaminated dipper cup with extension handle either directly into the sample container or from the sampling device into the sample container using decontaminated stainless steel spoons.

Surface Water Samples
Surface water samples were collected directly into the sample container or from a decontaminated dipper cup with extension handle and poured into the sample container.

The following sections detail the media type and location of the samples collected as well as the analytes detected in each sample.

4.1 SITE 1 – SOUTH RAMP SPRAY TEST AREA

Surface and subsurface soils in the grass-covered areas directly adjacent to the northeast and southwest sides of the paved ramp area and the shallow groundwater beneath the site were the focus of investigation at Site 1.

4.1.1 Sample Locations

Figure 4 (Appendix A) shows the locations of the samples collected at Site 1. Four surface soil samples (three primary and one field duplicate) and four subsurface soil samples (three primary and one field duplicate) were collected from three DPT borings at Site 1. The field sampling plan called for groundwater samples to be collected from three existing groundwater monitoring wells at the site (20MW28, 53M04B, and 20M14B). However, monitoring well 20MW28 could not be located so a primary and field duplicate groundwater sample were collected from well 20MW32 (in the same area) instead. In addition, a groundwater grab sample (EAFB01-GW-001-000) was collected from DPT boring EAFB01-SB-001. Table 2 (Appendix B) presents the sample number for each sample, the sample matrix, and rationale for sample collection.

4.1.2 Analytical Results

4.1.2.1 Groundwater

Five groundwater samples (four primary and one field duplicate) were submitted for analysis from Site 1. PFOS was detected in four of the five groundwater samples (including the field duplicate); the highest concentration, an estimated value of 9.7 µg/L was detected in the sample from monitoring well 20M14B at the south end of the site on the southeast side of Taxiway H. All four detected concentrations exceeded the EPA PHA for PFOS of 0.2 µg/L. PFOA was also detected in the same four groundwater samples, but only three concentrations (including the field duplicate) exceeded the EPA PHA for PFOA of 0.4 µg/L. The highest concentration of PFOA (1.1 µg/L) was detected in the sample from well 53M04B at the north end of the site on the northeast side of Taxiway H. Table 3 (Appendix B) presents the analytes detected in the groundwater samples at Site 1.

4.1.2.2 Soil

Four surface soil samples (three primary and one field duplicate sample) and four subsurface soil samples (three primary and one field duplicate sample) were submitted for analysis from Site 1. PFOS was detected in all four surface soil samples (including the field duplicate) but was only detected in two

subsurface soil samples. The highest concentration of PFOS (99 µg/kg) was detected in surface soil sample EAFB01-SB-003-001 collected on the northeast side of Taxiway H. PFOA was detected in the surface and subsurface samples of soil boring EAFB01-SB-003, with the highest concentration (2.6 µg/kg) also detected in surface soil sample EAFB01-SB-003-001. The highest detected concentrations of PFOS and PFOA in the soils at Site 1 were below the EPA RSSL of 6,000 µg/kg for PFOS and 16,000 µg/kg for PFOA. Table 4 (Appendix B) presents the analytes detected in the soil samples.

4.2 SITE 2 – KC-135 FIRE

The surface and subsurface soils in the grass-covered areas on each side of the parking apron and the shallow groundwater beneath the site were the focus of the investigation at Site 2.

4.2.1 Sample Locations

Figure 5 (Appendix A) shows the locations of the samples collected at Site 2. Two surface soil samples and three subsurface soil samples were collected from three DPT borings installed in the grass-covered areas adjacent to the tarmac at Taxiway F. The borings were on either side of the area where the aircraft fire was reportedly extinguished using AFFF mixtures. Groundwater samples were collected from temporary well points installed in the three DPT borings and from two existing shallow groundwater monitoring wells (MW30 and MW32). Table 5 (Appendix B) presents the sample number for each sample, the sample matrix, and rationale for sample collection.

4.2.2 Analytical Results

4.2.2.1 Groundwater

Five groundwater samples were submitted for analysis from Site 2. PFOS was detected in all five groundwater samples at concentrations exceeding the EPA PHA for PFOS of 0.2 µg/L; the highest concentration (an estimated concentration of 2,000 µg/L) was detected in the sample from well MW32, on the south end of the site on the northeast side of Taxiway F. PFOA was also detected in all five groundwater samples at concentrations exceeding the EPA PHA for PFOA of 0.4 µg/L; the highest concentration (an estimated concentration of 18 J µg/L) was also detected in the sample from well MW32. Table 6 (Appendix B) presents the analytes detected in the groundwater samples at Site 2.

4.2.2.2 Soil

Two surface soil samples and three subsurface samples were submitted for analysis from Site 2. PFOS was detected in all five samples; the highest concentration (140 µg/kg) was detected in surface soil sample EAFB02-SB-002-001, on the south side of the site on the west side of Taxiway F. None of the detected PFOS concentrations exceeded the EPA RSSL of 6,000 µg/kg for PFOS. PFOA was detected in three of the five soil samples, and the highest concentration (5.7 µg/kg) was detected in subsurface soil sample EAFB02-SB-003-003. The highest detected concentration of PFOA at Site 2 was below the EPA RSSL of 16,000 µg/kg for PFOA. Table 7 (Appendix A) presents the analytes detected in the soil samples at Site 2.

4.3 SITE 3 – FORMER BALL FIELD SPRAY AREA / GARRISON SLOUGH

The soils and the shallow groundwater in the area of the former ball field and the surface water/sediment in Garrison Slough downgradient of the former ball field area were the focus of the investigation.

4.3.1 Sample Locations

Figure 6 (Appendix A) shows the locations of the samples collected at Site 3. One surface soil sample and four subsurface soil samples were collected from the location of the former ball field between the fire station (Building 1206) and Hangar 1190. Groundwater samples were collected from two existing shallow groundwater monitoring wells (MW33A and MW33B) and from a temporary well point installed in DPT boring EAFB03-SB-002. Groundwater monitoring well 45MW23, identified as being at the northeast corner of Building 1206, was originally proposed for sampling. However, the well could not be located, so a groundwater sample was collected from a temporary well point installed in DPT boring EAFB03-SB-002, approximately 100 feet south and west of the reported location of 45MW23 instead. Surface water and sediment samples were also collected from the drainage channel of Garrison Slough approximately 950 feet east of, and in the surface drainage pathway from, the former ball field. Table 8 (Appendix B) presents the sample number for each sample, the sample matrix, and rationale for sample collection.

4.3.2 Analytical Results

4.3.2.1 Groundwater

Three groundwater samples were submitted for analysis from Site 3. PFOA was detected in all three of the groundwater samples with the highest concentration, an estimated value of 250.0 J µg/L, detected in the sample from monitoring well MW33A (sample EAFB03-GW-MW33A-000). PFOS was detected in all three groundwater samples, and the highest concentration, an estimated value of 22.0 J µg/L, was also detected in the sample from monitoring well MW33A. Two of the three detected concentrations of PFOA in the groundwater samples exceeded the EPA PHA of 0.4 µg/L for PFOA. All three detected concentrations of PFOS in the groundwater samples exceeded the corresponding EPA PHA of 0.2 µg/L for PFOS. Table 9 (Appendix B) presents the analytes detected in the groundwater samples.

4.3.2.2 Soil

One surface soil sample and four subsurface soil samples were submitted for analysis from Site 3. PFOS was detected in all five samples; the highest concentration (an estimated value of 5,700 J µg/kg) was detected in the surface soil sample (EAFB03-SB-001-001). PFOA was also detected in all five soil samples, and the highest concentration (140.0 µg/kg) was detected in subsurface soil sample EAFB03-SB-001-010. All detected concentrations of PFOS and PFOA in the soil samples at Site 3 were below the EPA RSSLs of 6,000 µg/kg for PFOS and 16,000 µg/kg for PFOA. Table 10 (Appendix B) presents the analytes detected in the soil samples.

4.3.2.3 Sediment

One sediment sample was submitted for analysis from Site 3. PFOS was detected in the sample at a concentration of 2.7 µg/kg. PFOA was not detected in the sediment sample. The detected concentration of PFOS in sediment sample at Site 3 was below the EPA RSSL of 6,000 µg/kg for PFOS. Table 11 (Appendix B) presents the analytes detected in the sediment sample.

4.3.2.4 Surface Water

Two surface water samples (one primary and one duplicate sample) were submitted for analysis from Site 3. PFOS was detected in both samples; the highest concentration (an estimated value of 2.4 J µg/L) was detected in the primary surface water sample (EAFB03-SW-001-001). PFOA was also detected in both samples, and the highest concentration (an estimated value of 0.53 J µg/L) was also detected in the primary sample. All detected concentrations of PFOS and PFOA in the surface water samples at Site 3 exceeded the corresponding EPA PHA of 0.2 µg/L for PFOS and 0.4 µg/L for PFOA. Table 12 (Appendix B) presents the analytes detected in the surface water samples.

4.4 SITE 4 – FOAMED RUNWAY

The focus of investigation in this area was the soil on either side of the main north-south runway (Runway 14/32) and the shallow groundwater beneath the site.

4.4.1 Sample Locations

Figure 7 (Appendix A) shows the locations of the samples collected at Site 4. Two surface soil samples and four subsurface soil samples were collected from DPT borings installed on either side of the main runway approximately 1,000 feet south of Taxiway A. Groundwater samples were collected from temporary well points installed in the four DPT borings. Table 13 (Appendix B) presents the sample number for each sample, the sample matrix, and rationale for sample collection.

4.4.2 Analytical Results

4.4.2.1 Groundwater

Four groundwater samples were submitted for analysis from Site 4. PFOA was detected in all four samples with the highest concentration (an estimated value of 0.069 J µg/L) detected in the sample from DPT boring EAFB04-SB-004. PFOS was also detected in all four samples with the highest concentration (an estimated value of 0.29 J µg/L) detected in the sample from DPT boring EAFB04-SB-003. None of the detected concentrations of PFOA exceeded the EPA PHA of 0.4 µg/L for PFOA, and only the sample with the highest concentration of PFOS (EAFB04-GW-003-000) exceeded the EPA PHA of 0.2 µg/L for PFOS. Table 14 (Appendix B) presents the analytes detected in the groundwater sample.

4.4.2.2 Soils

Two surface soil samples and four subsurface soil samples were submitted for analysis from Site 4. PFOS was detected in both surface soil samples and one subsurface soil sample, with the highest concentration (15 µg/kg) detected in the surface soil sample (EAFB047-SB-002-001) from DPT boring EAFB04-SB-002. PFOA was detected in only one sample, also in the surface soil EAFB04-SB-002-001, at a concentration of 2.8 µg/kg. All detected concentrations of PFOS and PFOA in the soils at Site 4 were below the respective EPA RSSLs of 6,000 µg/kg for PFOS and 16,000 µg/kg for PFOA. Table 15 (Appendix B) presents the analytes detected in the soil samples.

4.5 CONTAINMENT AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Three types of investigation-derived waste (IDW) were generated during the sampling activities. The IDW consisted of

- Waste soils generated during soil sampling activities;
- Wastewater generated from purging monitoring wells and decontaminating sampling equipment; and
- Construction waste, such as disposable gloves, paper, rags, plastic sheeting, etc.

SCF personnel placarded and managed the waste containers. Waste material was transported for off-site disposal by Emerald Alaska, Inc. (EAI) of Anchorage, Alaska.

4.5.1 Waste Soil

The waste soils generated during the installation of soil borings were placed into a single 55-gallon Department of Transportation (DOT)-approved steel drum. A waste characterization sample was collected from the composite soils and submitted to the project laboratory for analyses. The waste characterization sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/herbicides, Resource Conservation and Recovery Act (RCRA) metals, potential of hydrogen (pH), and ignitability/flashpoint. A laboratory data summary for the Toxicity Characteristic Leaching Procedure (TCLP) analysis is contained in Appendix D.

The drum was placarded as "Awaiting Analytical Results" and placed in a secure location while awaiting the determination of proper disposal. The analytical results indicated that the waste soil could be disposed of as nonhazardous, and EAI generated a waste profile based on the analytical results. The drum was transported to EAI for disposal on September 24, 2014. A copy of the waste disposal manifest is in Appendix E.

4.5.2 Wastewater

The waste fluids generated during well purging and decontamination activities were placed into a single 55-gallon DOT-approved steel drum. A waste characterization sample was collected from the composite waters and submitted to the project laboratory for analyses. The waste characterization sample was analyzed for VOCs, SVOCs, pesticides/herbicides, RCRA metals, pH, and ignitability/flashpoint. A laboratory data summary for the TCLP analysis is in Appendix D.

The drum was placarded as "Awaiting Analytical Results" and placed in a secure location while awaiting the determination of proper disposal. The analytical results indicated that the waste could be disposed of as nonhazardous, and EAI generated a waste profile for the fluids based on the analytical results. The drum was transported to EAI for disposal on September 24, 2014. A copy of the waste disposal manifest is in Appendix E.

4.5.3 Construction Waste

Construction waste (such as paper, plastic, trash, and personal protective equipment) generated during this project was placed in plastic garbage bags and deposited in an on-site dumpster for disposal at an off-site RCRA Subtitle D industrial landfill.

5. DATA VALIDATION

DataChek of Caswell Beach, North Carolina, conducted third-party data validation in September 2014 of 24 soil, one sediment, 17 groundwater, and two surface water samples analyzed for PFCs. Level III data

validation was performed on all samples following the logic identified in *The Contract Laboratory Program (CLP) Data Validation Functional Guidelines for Evaluating Organic Analyses* (EPA, June 2008). The data were labeled according to *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, January 2009). The TA Laboratory case narratives for each sample delivery group and the DataChek data validation report with the validated laboratory data sheets are in Appendix D.

6. DISCUSSION OF RESULTS

SCF identified 10 sites at EAFB as potential PFC source areas based on information provided by the ERP office, site operational history, known or potential release of materials containing PFCs at the sites, and interviews with personnel from base operations, the EAFB fire department, stormwater management, and AFFF systems maintenance. The 10 sites were ranked based on potential for PFC contamination, and logistical access. The four top ranking sites were selected for additional investigation to determine if PFCs were present in the environment, and if so, at what concentrations. This study was intended to determine only the presence or absence of PFCs at the selected sites and was not intended to differentiate between releases from facility operations and releases from other potential sources. Media investigated included soil, groundwater, surface water, and sediment. The four sites included AFFF firefighting equipment testing/cleaning areas, emergency response sites, and a surface water drainage collection point.

Based on the analytical results, the media with concentrations of PFCs exceeding the project screening levels were groundwater at all four sites and surface water at one site. In general PFCs do not appear to have been retained in soils at high concentrations but tend to migrate directly to groundwater. PFCs in solution in surface water tend to stay in solution and do not appear to redeposit in sediment. The highest concentrations of PFCs detected at EAFB were found where relatively high volumes of AFFF were released to during an emergency response. The following sections summarize the findings at each of the four sites of the current investigation.

6.1 SITE 1 – SOUTH RAMP SPRAY TEST AREA

Site 1 is a fire equipment certification area for spray systems on fire trucks. The objectives of the investigation at Site 1 were to determine what, if any, concentrations of PFCs remained in the soils on either side of the ramp and if the shallow groundwater beneath the site has been impacted by the release of AFFF fluids. The media sampled during this investigation were surface/subsurface soils and the shallow groundwater beneath the site. No standing surface water bodies or drainage structures are in the Site 1 area; therefore, no surface water or sediment samples were planned for collection.

The depth to groundwater in this area was found to be approximately 3 to 6 feet bgs, and the groundwater flow direction is to the north-northwest. Groundwater samples were collected from three existing wells at the site and from on temporary well point installed in a DPT boring. Four of the five groundwater samples (three primary and one field duplicate) had detected concentrations of PFCs exceeding the EPA PHAs. None of the eight soil samples (six primary and two field duplicates) had detected concentrations of PFCs exceeding the EPA RSSLs.

Based on the results of the investigation, the groundwater beneath the ramp area has been impacted by the release of AFFF material at this site, but PFCs have not been retained in the soils at concentrations exceeding the project screening levels. Further groundwater sampling may be warranted.

6.2 SITE 2 – KC-135 FIRE

Site 2 was the site of an emergency response to an aircraft fire involving the one-time release of unknown quantity of AFFF fluids on the parking apron in front of Hangar 1190. The objectives of the investigation at Site 2 were to determine if PFCs remained in the soils on either side of Taxiway F and if the shallow groundwater beneath the area had been impacted by the release of AFFF fluids. No standing surface water bodies or drainage structures are in the Site 2 area; therefore, no surface water or sediment samples were planned for collection.

The depth to groundwater in this area was from 5 to 8 feet bgs, and the groundwater flow direction is to the north-northwest. All five groundwater samples analyzed from the shallow groundwater wells in this area had detected concentrations of PFCs exceeding the EPA PHAs for both PFOS and PFOA. None of the five soil samples (two surface soil and three subsurface soil samples) had detected concentrations of PFCs exceeding the EPA RSSLs.

Based on the results of the investigation, the groundwater beneath the Site 2 area has been impacted by the discharge of AFFF fluids, but PFCs have not been retained in the soils at concentrations exceeding the project screening levels. Further groundwater sampling may be warranted.

6.3 SITE 3 – FORMER BALL FIELD SPRAY AREA / GARRISON SLOUGH

Site 3 is a former ball field that was previously used for the periodic certification testing of the spray systems on fire trucks. The objectives of the investigation at Site 3 were to determine what, if any, concentrations of PFCs remain in the soils at the former ball field between Hangar 1190 and the current fire station (Building 1206) and if the shallow groundwater beneath the site has been impacted by the release of AFFF fluids. The media sampled during this investigation were surface/subsurface soils and the shallow groundwater beneath the site. A portion of the main surface water drainage feature for EAFB, Garrison Slough, is in the surface drainage pathway approximately 950 feet east and south of the site. Therefore, surface water and sediment samples were collected from the channel in Garrison Slough where it passes under Central Avenue.

The depth to groundwater in this area was approximately 10 feet bgs, and the groundwater flow direction is generally to the west. All three groundwater samples analyzed from this area had detected concentrations exceeding the EPA PHAs for PFOS, and two of the three samples had detected concentrations exceeding the EPA PHA for PFOA. None of the five soil samples (one surface soil and four subsurface soil samples) collected in the former ball field area had detected concentrations of PFCs exceeding the EPA RSSLs. Both surface water samples (primary and field duplicate) collected in Garrison Slough had detected concentrations of PFOS and PFOA exceeding the EPA PHAs. However, PFCs were not detected in the co-located sediment sample at concentrations exceeding the EPA RSSLs.

Based on the results of the investigation, the groundwater beneath the Site 3 area and the surface water in Garrison Slough have been impacted by the discharge of AFFF fluids. However, PFCs have not been retained in the soils at the former ball field or in the sediments in Garrison Slough at concentrations exceeding the project screening levels. Further groundwater and surface water sampling may be warranted.

6.4 SITE 4 –FOAMED RUNWAY

Site 4 is the area of the main north-south runway that was coated with AFFF as a precautionary measure during the landing of an aircraft with potential mechanical problems in the landing gear. The objectives

of the investigation for Site 4 were to determine what, if any, concentrations of PFCs remain in the soils on either side of the runway and if the shallow groundwater beneath the site has been impacted by the release of AFFF fluids. The media sampled during this investigation were surface/subsurface soils and the shallow groundwater beneath the site. No standing surface water bodies or drainage structures are in the Site 4 area; therefore, no surface water or sediment samples were planned for collection.

The depth to groundwater in this area was 4 to 8 feet bgs, and the groundwater flow direction is to the north-northwest. Only one groundwater sample had a detected concentration of PFOS exceeding the EPA PHA for PFOS. None of the six soil samples (two surface soil and four subsurface soil samples) had detected concentrations of PFCs exceeding the EPA RSSLs.

Based on the results of the investigation, the groundwater beneath Site 4 area has been impacted to a minimal extent by the release of AFFF fluids. However, PFCs have not been retained in the soils surrounding the runway at concentrations exceeding the project screening levels. Further groundwater sampling may be warranted.

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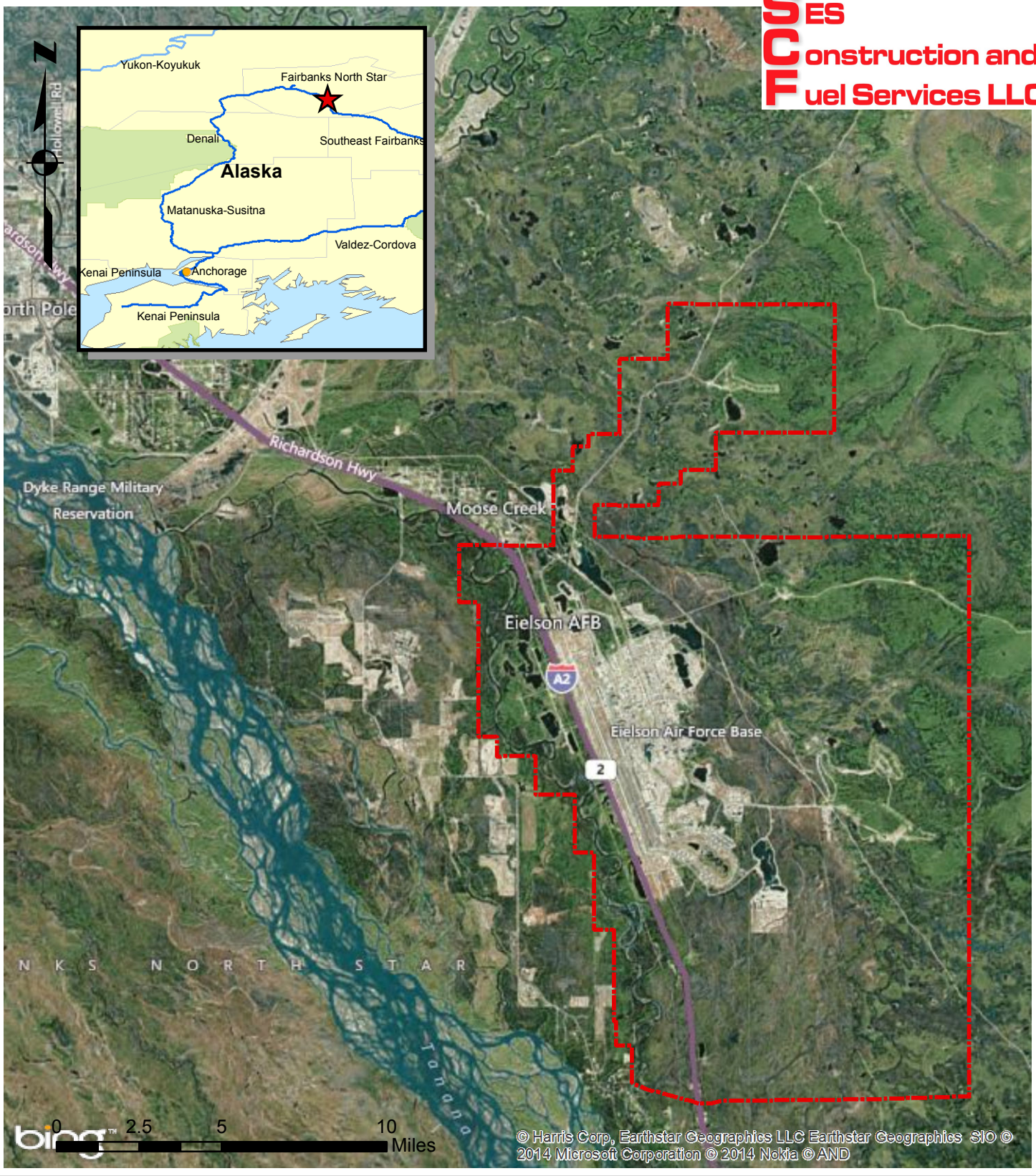
Appendix A

Figures

SES Construction and Fuel Services LLC



Legend:

Installation area

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the United States
Source: Eielson AFB GIS

Figure 1 Location Map of Eielson Air Force Base, Alaska

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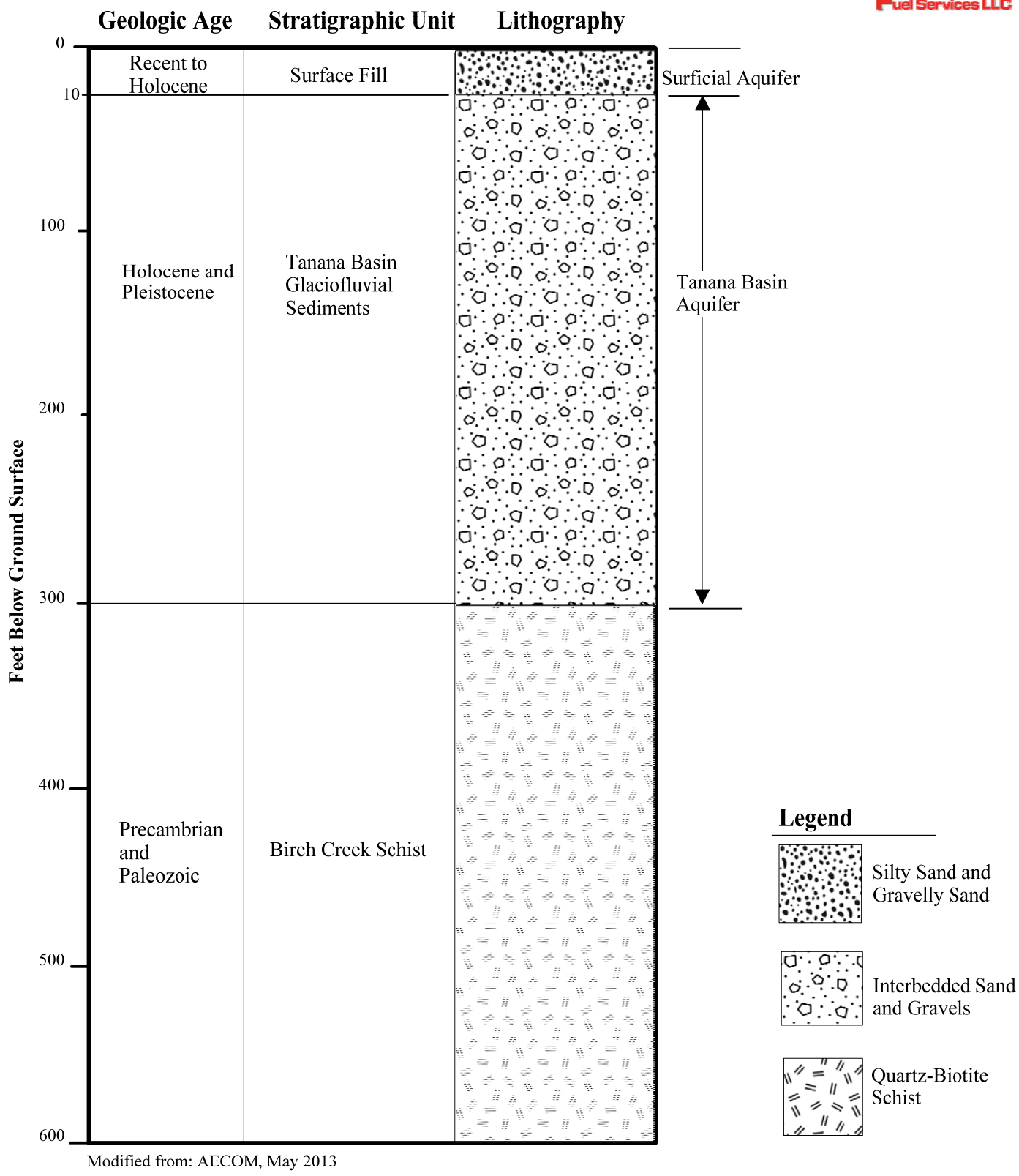
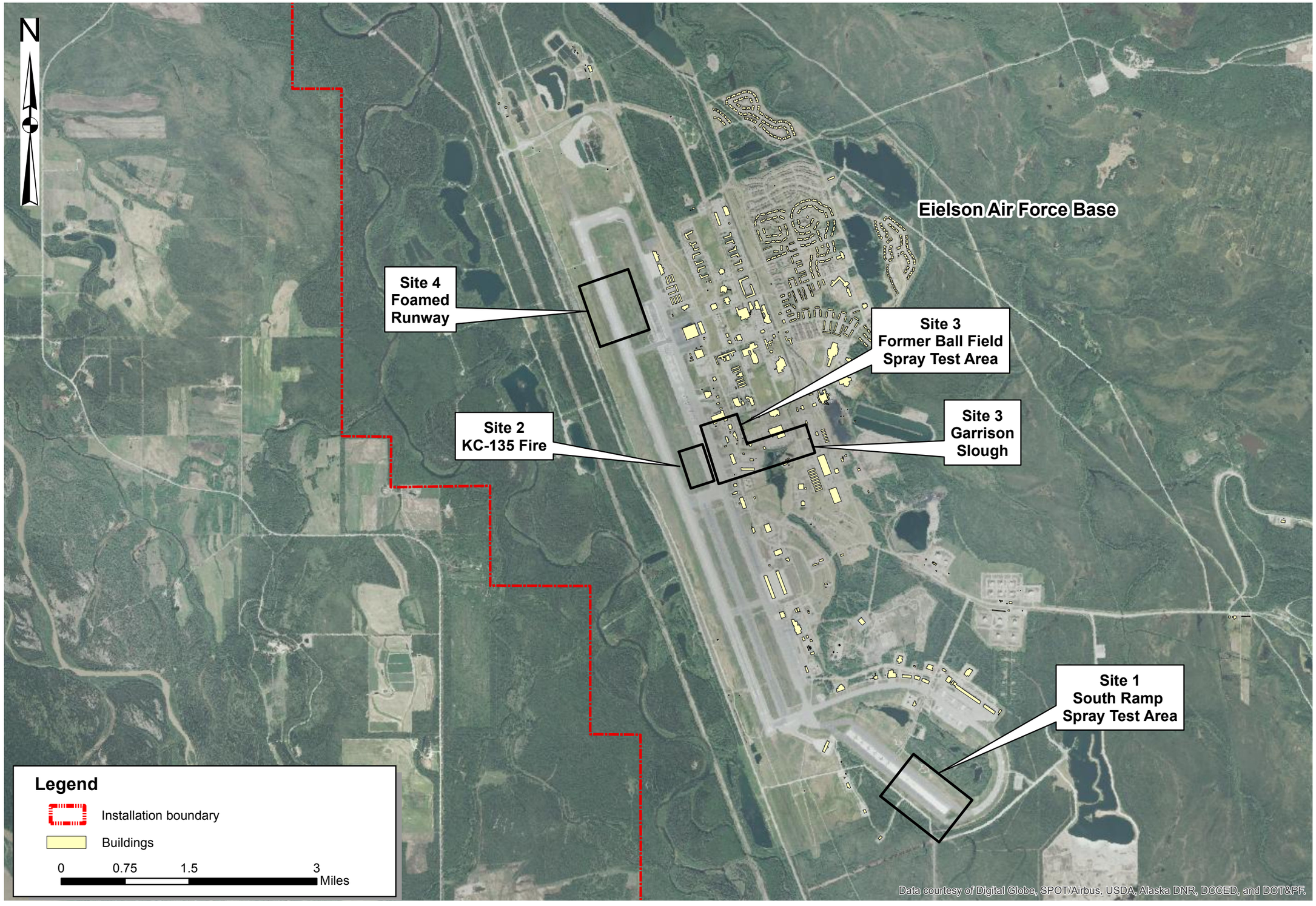


Figure 2 Generalized Hydrogeologic Cross Section, Eielson AFB, Alaska



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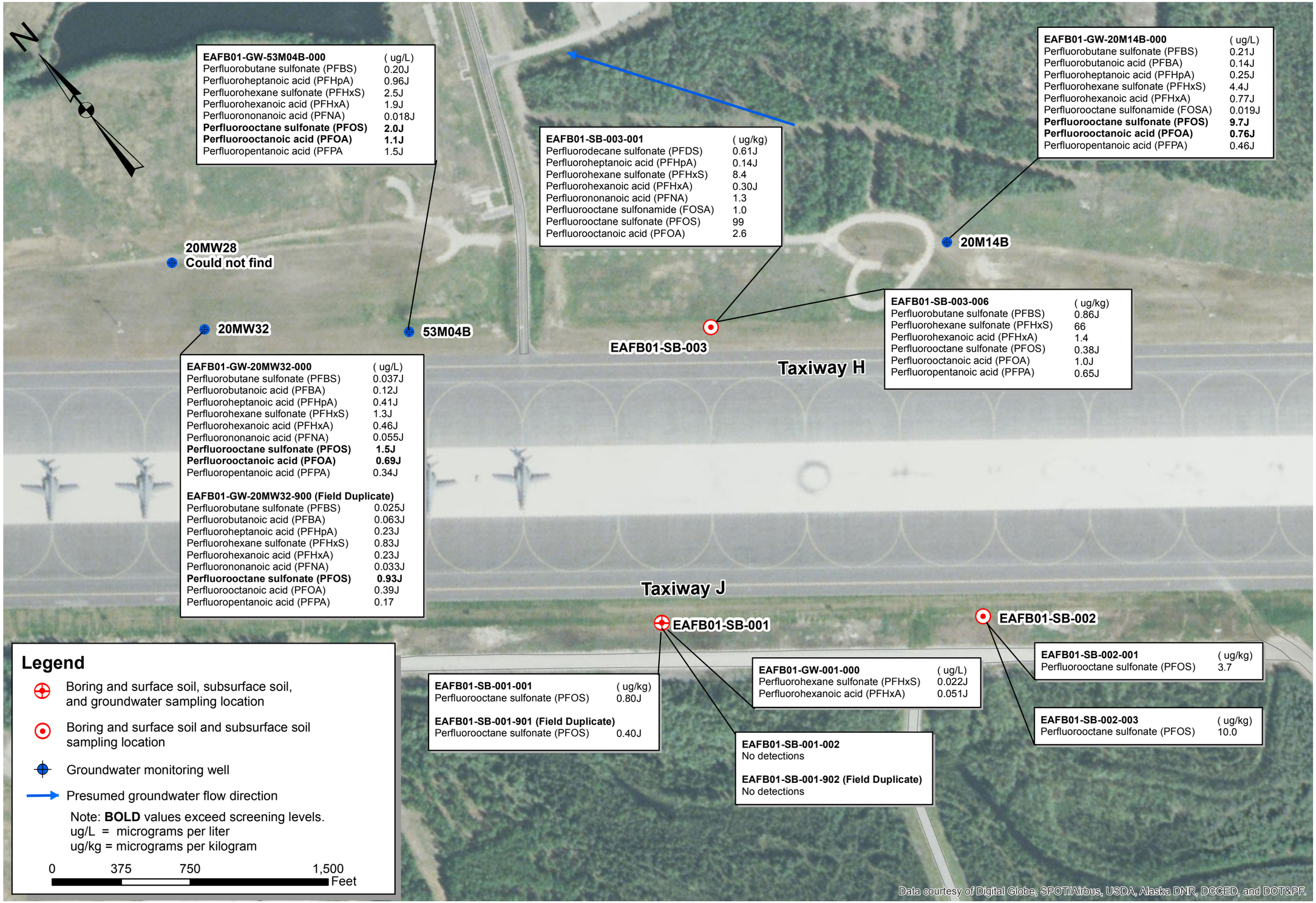
SES Construction and Fuel Services LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the States
Source: Eielson AFB GIS

Figure 3 Site Locations for AFFF Investigations at Eielson Air Force Base, Alaska



R:\Projects\Q1062.0007\ Altus AFB\Graphics\Fig 4 Eielson AFB South Ramp Sample Results.mxd (11/4/2014)

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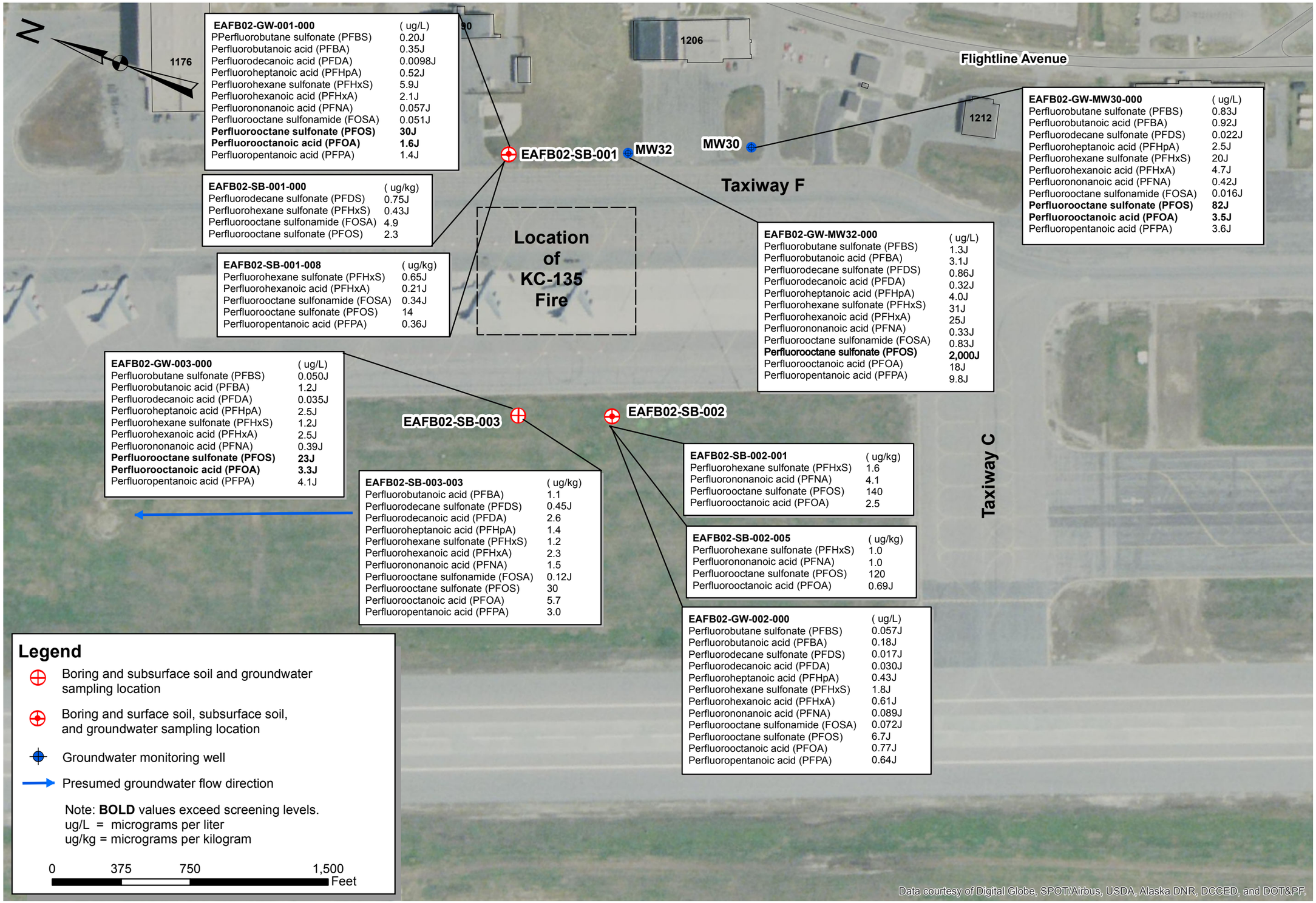
Figure 4 Site 1 South Ramp Spray Test Area
Sample Locations and Detection Summary
for AFFF Investigations at
Eielson Air Force Base, Alaska

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the States
Source: Eielson AFB GIS



EAFB02-GW-001-000 (ug/L)

PPerfluorobutane sulfonate (PFBS)	0.20J
Perfluorobutanoic acid (PFBA)	0.35J
Perfluorodecanoic acid (PFDA)	0.0098J
Perfluoroheptanoic acid (PFHpA)	0.52J
Perfluorohexane sulfonate (PFHxS)	5.9J
Perfluorohexanoic acid (PFHxA)	2.1J
Perfluorononanoic acid (PFNA)	0.057J
Perfluorooctane sulfonamide (FOSA)	0.051J
Perfluorooctane sulfonate (PFOS)	**30J**
Perfluorooctanoic acid (PFOA)	**1.6J**
Perfluoropentanoic acid (PFPA)	1.4J

EAFB02-SB-001-000 (ug/kg)

Perfluorodecane sulfonate (PFDS)	0.75J
Perfluorohexane sulfonate (PFHxS)	0.43J
Perfluorooctane sulfonamide (FOSA)	4.9
Perfluorooctane sulfonate (PFOS)	2.3

EAFB02-SB-001-008 (ug/kg)

Perfluorohexane sulfonate (PFHxS)	0.65J
Perfluorohexanoic acid (PFHxA)	0.21J
Perfluorooctane sulfonamide (FOSA)	0.34J
Perfluorooctane sulfonate (PFOS)	14
Perfluoropentanoic acid (PFPA)	0.36J

EAFB02-GW-MW30-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	0.83J
Perfluorobutanoic acid (PFBA)	0.92J
Perfluorodecane sulfonate (PFDS)	0.022J
Perfluoroheptanoic acid (PFHpA)	2.5J
Perfluorohexane sulfonate (PFHxS)	20J
Perfluorohexanoic acid (PFHxA)	4.7J
Perfluorononanoic acid (PFNA)	0.42J
Perfluorooctane sulfonamide (FOSA)	0.016J
Perfluorooctane sulfonate (PFOS)	**82J**
Perfluorooctanoic acid (PFOA)	**3.5J**
Perfluoropentanoic acid (PFPA)	3.6J

EAFB02-GW-MW32-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	1.3J
Perfluorobutanoic acid (PFBA)	3.1J
Perfluorodecane sulfonate (PFDS)	0.86J
Perfluorodecanoic acid (PFDA)	0.32J
Perfluoroheptanoic acid (PFHpA)	4.0J
Perfluorohexane sulfonate (PFHxS)	31J
Perfluorohexanoic acid (PFHxA)	25J
Perfluorononanoic acid (PFNA)	0.33J
Perfluorooctane sulfonamide (FOSA)	0.83J
Perfluorooctane sulfonate (PFOS)	**2,000J**
Perfluorooctanoic acid (PFOA)	18J
Perfluoropentanoic acid (PFPA)	9.8J

EAFB02-GW-003-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	0.050J
Perfluorobutanoic acid (PFBA)	1.2J
Perfluorodecanoic acid (PFDA)	0.035J
Perfluoroheptanoic acid (PFHpA)	2.5J
Perfluorohexane sulfonate (PFHxS)	1.2J
Perfluorohexanoic acid (PFHxA)	2.5J
Perfluorononanoic acid (PFNA)	0.39J
Perfluorooctane sulfonate (PFOS)	**23J**
Perfluorooctanoic acid (PFOA)	**3.3J**
Perfluoropentanoic acid (PFPA)	4.1J

EAFB02-SB-003-003 (ug/kg)

Perfluorobutanoic acid (PFBA)	1.1
Perfluorodecane sulfonate (PFDS)	0.45J
Perfluorodecanoic acid (PFDA)	2.6
Perfluoroheptanoic acid (PFHpA)	1.4
Perfluorohexane sulfonate (PFHxS)	1.2
Perfluorohexanoic acid (PFHxA)	2.3
Perfluorononanoic acid (PFNA)	1.5
Perfluorooctane sulfonamide (FOSA)	0.12J
Perfluorooctane sulfonate (PFOS)	30
Perfluorooctanoic acid (PFOA)	5.7
Perfluoropentanoic acid (PFPA)	3.0

EAFB02-SB-002-001 (ug/kg)

Perfluorohexane sulfonate (PFHxS)	1.6
Perfluorononanoic acid (PFNA)	4.1
Perfluorooctane sulfonate (PFOS)	140
Perfluorooctanoic acid (PFOA)	2.5

EAFB02-SB-002-005 (ug/kg)

Perfluorohexane sulfonate (PFHxS)	1.0
Perfluorononanoic acid (PFNA)	1.0
Perfluorooctane sulfonate (PFOS)	120
Perfluorooctanoic acid (PFOA)	0.69J

EAFB02-GW-002-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	0.057J
Perfluorobutanoic acid (PFBA)	0.18J
Perfluorodecane sulfonate (PFDS)	0.017J
Perfluorodecanoic acid (PFDA)	0.030J
Perfluoroheptanoic acid (PFHpA)	0.43J
Perfluorohexane sulfonate (PFHxS)	1.8J
Perfluorohexanoic acid (PFHxA)	0.61J
Perfluorononanoic acid (PFNA)	0.089J
Perfluorooctane sulfonamide (FOSA)	0.072J
Perfluorooctane sulfonate (PFOS)	6.7J
Perfluorooctanoic acid (PFOA)	0.77J
Perfluoropentanoic acid (PFPA)	0.64J

Legend

- Boring and subsurface soil and groundwater sampling location
- Boring and surface soil, subsurface soil, and groundwater sampling location
- Groundwater monitoring well
- Presumed groundwater flow direction

Note: **BOLD** values exceed screening levels.
ug/L = micrograms per liter
ug/kg = micrograms per kilogram

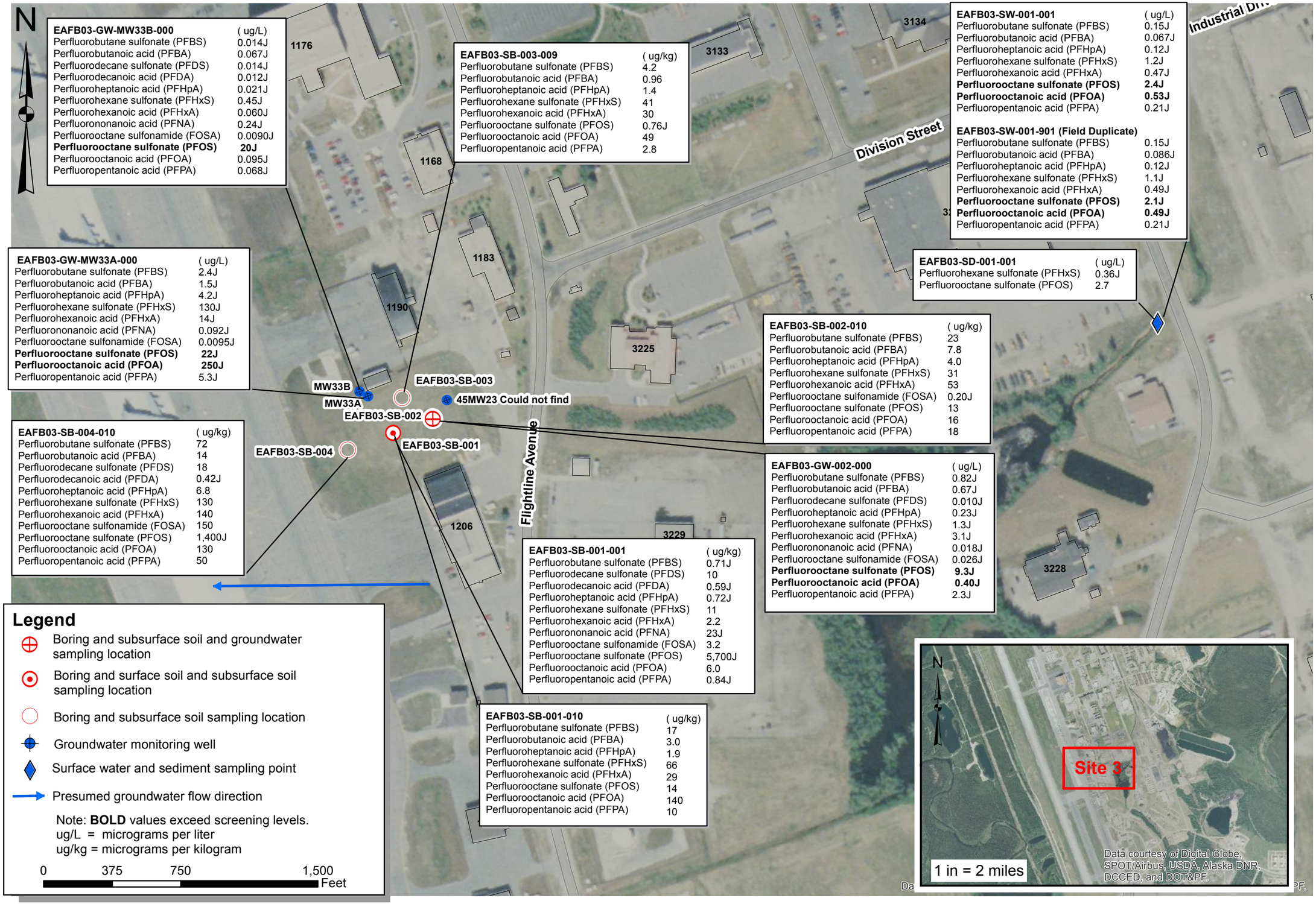
0 375 750 1,500 Feet

SES Construction and Fuel Services LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the States
Source: Eielson AFB GIS

Figure 5 Site 2 KC-135 Fire
Sample Locations and Detection Summary for AFFF Investigations at Eielson Air Force Base, Alaska

R:\Projects\Q1062.0007\ Altus AFB\Graphics\Fig 5 Eielson AFB KC 135 Fire Sample Results.mxd (11/5/2014)



R:\Projects\Q1062.0007\ Altus AFB\Graphics\Fig 6 and 7 Eielson AFB Sample Results.mxd (11/5/2014)

SES Construction and Fuel Services LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the States
Source: Eielson AFB GIS

Figure 6 Site 3 Former Ball Field Spray Test Area/Garrison Slough Sample Locations and Detection Summary for AFFF Investigations at Eielson Air Force Base, Alaska

N

Taxiway A

EAFB04-SB-003-002 (ug/kg)
Perfluorohexane sulfonate (PFHxS) 0.37J

EAFB04-GW-003-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	0.015J
Perfluorobutanoic acid (PFBA)	0.10J
Perfluoroheptanoic acid (PFHpA)	0.081J
Perfluorohexane sulfonate (PFHxS)	0.24J
Perfluorohexanoic acid (PFHxA)	0.74J
Perfluorooctane sulfonate (PFOS)	**0.29J**
Perfluorooctanoic acid (PFOA)	0.030J
Perfluoropentanoic acid (PFPA)	0.064J

EAFB04-SB-003

EAFB04-GW-001-000 (ug/L)

Perfluoroheptanoic acid (PFHpA)	0.018J
Perfluorohexane sulfonate (PFHxS)	0.089J
Perfluorohexanoic acid (PFHxA)	0.026J
Perfluorooctane sulfonate (PFOS)	0.14J
Perfluorooctanoic acid (PFOA)	0.021J
Perfluoropentanoic acid (PFPA)	0.028J

EAFB04-SB-001-001 (ug/kg)
Perfluorooctane sulfonate (PFOS) 0.78J

EAFB04-SB-001-004
No detections

EAFB04-SB-001

EAFB04-GW-002-000 (ug/L)

Perfluoroheptanoic acid (PFHpA)	0.027J
Perfluorohexane sulfonate (PFHxS)	0.059J
Perfluorohexanoic acid (PFHxA)	0.035J
Perfluorooctane sulfonate (PFOS)	0.080J
Perfluorooctanoic acid (PFOA)	0.032J
Perfluoropentanoic acid (PFPA)	0.037J

EAFB04-SB-002-001 (ug/kg)

Perfluorohexane sulfonate (PFHxS)	1.9
Perfluorononanoic acid (PFNA)	1.5
Perfluorooctane sulfonate (PFOS)	15
Perfluorooctanoic acid (PFOA)	2.8

EAFB04-SB-002-008 (ug/kg)

Perfluoroheptanoic acid (PFHpA)	0.43J
Perfluorohexane sulfonate (PFHxS)	1.7

EAFB04-SB-002

EAFB04-GW-004-000 (ug/L)

Perfluorobutane sulfonate (PFBS)	0.029J
Perfluorobutanoic acid (PFBA)	0.055J
Perfluoroheptanoic acid (PFHpA)	0.27J
Perfluorohexane sulfonate (PFHxS)	0.31J
Perfluorohexanoic acid (PFHxA)	0.37J
Perfluorooctane sulfonate (PFOS)	0.059J
Perfluorooctanoic acid (PFOA)	0.069J
Perfluoropentanoic acid (PFPA)	0.22J

EAFB04-SB-004

EAFB04-SB-004-005 (ug/kg)
Perfluorononanoic acid (PFNA) 0.50J
Perfluorooctane sulfonate (PFOS) 3.3

West Perimeter Road

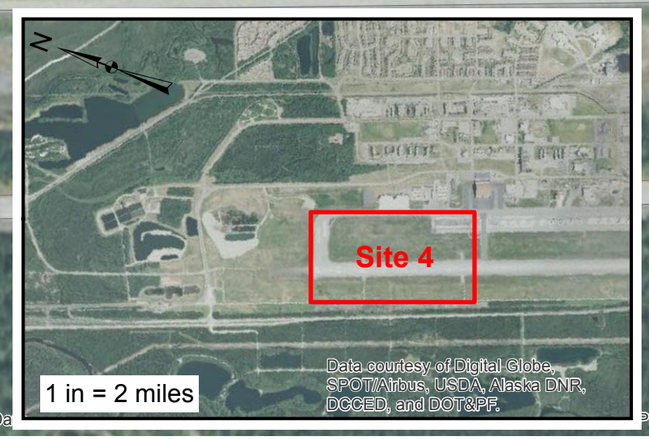
Richardson Highway

Legend

- Boring and subsurface soil and groundwater sampling location
- Boring and surface soil, subsurface soil, and groundwater sampling location
- Presumed groundwater flow direction

Note: **BOLD** values exceed screening levels.
ug/L = micrograms per liter
ug/kg = micrograms per kilogram

0 450 900 1,800 Feet



SCES Construction and Fuel Services LLC
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Oak Ridge, Tennessee 37830

Figure 7 Site 4 Foamed Runway
Sample Locations and Detection Summary
for AFFF Investigations at
Eielson Air Force Base, Alaska

Job Title: Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the States
Source: Eielson AFB GIS

R:\Projects\Q1062.0007\ Altus AFB\Graphics\Fig 8 Eielson AFB Foamed Runway Sample Results.mxd (11/5/2014)

Appendix B

Tables

Table 1 Water Levels Measured in Sampled Wells

Location	Northing	Easting	Total Depth of Well (Feet/BTOC)	Depth to Water (Feet/BTOC)	Top of Casing Elevation (Feet/AMSL)	Water Elevation (Feet/AMSL)
Site 1 - South Ramp Spray Test Area						
20MW32	23,514,611.920	1,629,431.840	15.25	6.25	552.57*	546.32
20M14B	23,519,586.300	1,631,313.350	15.70	5.01	552.18	547.17
53M04B	23,520,311.140	1,630,218.530	16.50	6.30	552.57	546.27
Site 2 - KC-135 Fire						
MW30	23,521,732.800	1,625,476.160	17.30	7.51	548.73*	541.22
MW32	23,522,005.040	1,625,367.920	15.80	7.75	548.73*	540.98
Site 3 - Ball Field Spray Test Area and Garrison Slough						
45MW33A	23,522,280.560	1,625,463.040	16.80	9.61	548.73*	539.12
45MW33B	23,522,287.120	1,625,430.240	56.50	9.85	548.73*	538.88
Site 4 - Foamed Runway						
No existing wells to sample at site.						

Note: Coordinates are in UTM 6 W, US feet. Elevation are based on North American Vertical Datum (NAVD) 1988.
*Elevations are estimated.
AMSL = above mean sea level BTOC = below top of casing

Table 2 Environmental Samples Collected at the South Ramp Spray Area (Site 1)

Sample Identifier	Matrix	Purpose/Location
EAFB01-GW-20MW32-000/ EAFB01-GW-20MW32-900 (Field Duplicate)	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing monitoring well situated on the northeast side of Taxiway H.
EAFB01-GW-20M14B-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing monitoring well situated at the end of the turnaround on the northeast side of Taxiway H.
EAFB01-GW-53M04B-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing monitoring well situated on the northeast side of Taxiway H.
EAFB01-GW-001-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from soil boring on the south side of Taxiway J.
EAFB01-SB-001-001/ EAFB01-SB-001-901 (Field Duplicate)	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil in boring on the south side of Taxiway J.
EAFB01-SB-001-002	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at first water-saturated zone (2 feet bgs) in boring on the south side of Taxiway J.
EAFB01-SB-002-001	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil in boring on the south side of Taxiway J.
EAFB01-SB-002-003	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at first water-saturated zone (3 feet bgs) in boring on the south side of Taxiway J.
EAFB01-SB-003-001	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil in boring on the northeast side of Taxiway H.
EAFB01-SB-003-006	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at first water-saturated zone (6 feet bgs) in boring on the northeast side of Taxiway H.

bgs = below ground surface PFC = perfluorinated chemical or compound

Table 3 Perfluorinated Chemicals Detected in Groundwater Samples at South Ramp Spray Area (Site 1)

Sample Number			EAFB01-GW-001-000		EAFB01-GW-20M14B-000		EAFB01-GW-20MW32-000		EAFB01-GW-20MW32-900 (Field Duplicate)		EAFB01-GW-53M04B-000	
Analyte	**CAS Number**	**EPA PHA (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL	0.0092 UJ	0.0085	0.21 J	0.0079	0.037 J	0.0079	0.025 J	0.0078	0.20 J	0.0081
Perfluorobutanoic acid (PFBA)	375-22-4	NL	0.010 UJ	0.010	0.14 J	0.0093	0.12 J	0.0094	0.063 J	0.0093	0.0098 UJ	0.0096
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.021 UJ	0.014	0.25 J	0.013	0.41 J	0.013	0.23 J	0.013	0.96 J	0.013
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	0.022 J	0.0072	4.4 J	0.0066	1.3 J	0.0067	0.83 J	0.0066	2.5 J	0.0068
Perfluorohexanoic acid (PFHxA)	307-24-4	NL	0.051 J	0.0030	0.77 J	0.0028	0.46 J	0.0028	0.23 J	0.0028	1.9 J	0.0028
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.021 UJ	0.018	0.019 UJ	0.017	0.055 J	0.017	0.033 J	0.017	0.018 J	0.017
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL	0.041 UJ	0.015	0.019 J	0.0057	0.079 UJ	0.030	0.053 UJ	0.020	0.017 UJ	0.0063
Perfluorooctane sulfonate (PFOS)	1763-23-1	0.2	0.021 UJ	0.014	**9.7 J**	**0.013**	**1.5 J**	**0.013**	**0.93 J**	**0.013**	**2.0 J**	**0.013**
Perfluorooctanoic acid (PFOA)	335-67-1	0.4	0.010 UJ	0.010	**0.76 J**	**0.0093**	**0.69 J**	**0.0094**	0.39 J	0.0093	**1.1 J**	**0.0096**
Perfluoropentanoic acid (PFPA)	2706-90-3	NL	0.010 UJ	0.011	0.46 J	0.010	0.34 J	0.010	0.17 J	0.010	1.5 J	0.011

Note: Shaded values indicate analyte not detected at the Method Detection Limit. **Bold** values exceed project screening levels.
µg/L = micrograms per liter
EPA = Environmental Protection Agency
PHA = Provisional Health Advisory
CAS = Chemical Abstract Service
J = estimated value
U = analyte not detected at the Method Detection Limit

Table 4 Perfluorinated Chemicals Detected in Soil at the South Ramp Spray Area (Site 1)

Sample Number			EAFB01-SB-001-001		EAFB01-SB-001-002		EAFB01-SB-001-901 (Field Duplicate)		EAFB01-SB-001-902 (Field Duplicate)		EAFB01-SB-002-001		EAFB01-SB-002-003		EAFB01-SB-003-001		EAFB01-SB-003-006	
Analyte	CAS Number	EPA RSSL (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL	0.84 U	0.20	0.74 U	0.17	0.69 U	0.16	0.81 U	0.19	0.78 U	0.18	0.73 U	0.17	0.69 U	0.16	0.86 J	0.19
Perfluorodecane sulfonate (PFDS)	67906-42-7	NL	0.84 U	0.42	0.74 U	0.37	0.69 U	0.35	0.81 U	0.40	0.78 U	0.39	0.73 U	0.37	0.61 J	0.34	0.83 U	0.41
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.84 U	0.17	0.74 U	0.15	0.69 U	0.14	0.81 U	0.16	0.78 U	0.16	0.73 U	0.15	0.14 J	0.14	0.83 U	0.17
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	0.84 U	0.39	0.74 U	0.35	0.69 U	0.32	0.81 U	0.38	0.78 U	0.36	0.73 U	0.34	8.4	0.32	66	0.39
Perfluorohexanoic acid (PFHxA)	307-24-4	NL	0.84 U	0.21	0.74 U	0.19	0.69 U	0.17	0.81 U	0.20	0.78 U	0.20	0.73 U	0.18	0.30 J	0.17	1.4	0.21
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.84 U	0.31	0.74 U	0.27	0.69 U	0.25	0.81 U	0.30	0.78 U	0.29	0.73 U	0.27	1.3	0.25	0.83 U	0.30
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL	0.84 U	0.14	0.74 U	0.12	0.69 U	0.11	0.81 U	0.13	0.78 U	0.13	0.73 U	0.12	1.0	0.11	0.83 U	0.13
Perfluorooctane sulfonate (PFOS)	1763-23-1	6,000	0.80 J	0.20	0.74 U	0.17	0.40 J	0.16	0.81 U	0.19	3.7	0.18	10	0.17	99	0.16	0.38 J	0.19
Perfluorooctanoic acid (PFOA)	335-67-1	16,000	0.84 U	0.32	0.74 U	0.29	0.69 U	0.27	0.81 U	0.31	0.78 U	0.30	0.73 U	0.28	2.6	0.26	1.0 J	0.32
Perfluoropentanoic acid (PFPA)	2706-90-3	NL	0.84 U	0.33	0.74 U	0.30	0.69 U	0.28	0.81 U	0.32	0.78 U	0.31	0.73 U	0.29	0.69 U	0.28	0.65 J	0.33

Note: Shaded values indicate analyte not detected at the Method Detection Limit.
µg/kg = micrograms per kilogram
EPA = Environmental Protection Agency
NL = not listed; an EPA RSSL value has not been established for this analyte
U = analyte not detected at the Method Detection Limit

CAS = Chemical Abstract Service
J =estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors.
RSSL = Residential Soil Screening Level (EPA memorandum, November 2009)

Table 5 Environmental Samples Collected at KC-135 Fire (Site 2)

Sample Identifier	Matrix	Purpose/Location
EAFB02-GW-001-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB02-SB-001, on north end of the site, on the northeast side of Taxiway F.
EAFB02-GW-002-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB02-SB-002, on south end of the site, on the southwest side of Taxiway F.
EAFB02-GW-003-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB02-SB-003, on north end of the site, on the northwest side of Taxiway F.
EAFB02-GW-MW30-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing shallow monitoring well MW30 on the southeast side of Taxiway F.
EAFB02-GW-MW32-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing shallow monitoring well MW32 on the southeast side of Taxiway F.
EAFB02-SB-001-001	Surface Soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil on north end of the site, on the northeast side of Taxiway F.
EAFB02-SB-001-008	Subsurface Soil	Determine if PFCs remain in the subsurface soil. Sample collected at 8 feet bgs in DPT boring on north end of the site, on the northeast side of Taxiway F.
EAFB02-SB-002-001	Surface Soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil on south end of the site on the southwest side of Taxiway F.
EAFB02-SB-002-005	Subsurface Soil	Determine if PFCs remain in the subsurface soil. Sample collected at a depth of 5 feet bgs in DPT boring on south end of the site, on the southwest side of Taxiway F.
EAFB02-SB-003-003	Subsurface Soil	Determine if PFCs remain in the subsurface soil. Sample collected at a depth of 3 feet bgs in DPT boring on north end of the site, on the northwest side of Taxiway F.

bgs = below ground surface
DPT = direct push technology
PFC = perfluorinated chemical or compound

Table 6 Perfluorinated Chemicals Detected in Groundwater Samples at KC-135 Fire (Site 2)

Sample Number			EAFB02-GW-001-000		EAFB02-GW-002-000		EAFB02-GW-003-000		EAFB02-GW-MW30-000		EAFB02-GW-MW32-000	
Analyte	**CAS Number**	**EPA PHA (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**	**Result (µg/L)**	**Reporting Limit (µg/L)**
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL	0.20 J	0.0099	0.057 J	0.0084	0.050 J	0.0082	0.83 J	0.0082	1.3 J	0.0082
Perfluorobutanoic acid (PFBA)	375-22-4	NL	0.35 J	0.012	0.18 J	0.010	1.2 J	0.0097	0.92 J	0.0097	3.1 J	0.0098
Perfluorodecane sulfonate (PFDS)	67906-42-7	NL	0.012 UJ	0.011	0.017 J	0.0094	0.0099 UJ	0.0091	0.022 J	0.0091	0.86 J	0.0091
Perfluorodecanoic acid (PFDA)	335-76-2	NL	0.0098 J	0.0094	0.030 J	0.0080	0.035 J	0.0078	0.0099 UJ	0.0078	0.32 J	0.0078
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.52 J	0.016	0.43 J	0.014	2.5 J	0.013	2.5 J	0.013	4.0 J	0.013
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	5.9 J	0.0084	1.8 J	0.0071	1.2 J	0.0069	20 J	0.0069	31 J	0.0069
Perfluorohexanoic acid (PFHxA)	307-24-4	NL	2.1 J	0.0035	0.61 J	0.0030	2.5 J	0.0029	4.7 J	0.0029	25 J	0.0029
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.057 J	0.021	0.089 J	0.018	0.39 J	0.017	0.42 J	0.017	0.33 J	0.017
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL	0.051 J	0.041	0.072 J	0.0061	0.016 UJ	0.0060	0.016 J	0.0058	0.83 J	0.0054
Perfluorooctane sulfonate (PFOS)	1763-23-1	0.2	**30 J**	0.016	**6.7 J**	0.014	**23 J**	0.013	**82 J**	0.013	**2000 J**	0.013
Perfluorooctanoic acid (PFOA)	335-67-1	0.4	**1.6 J**	0.012	**0.77 J**	0.010	**3.3 J**	0.0097	**3.5 J**	0.0097	**18 J**	0.0097
Perfluoropentanoic acid (PFPA)	2706-90-3	NL	1.4 J	0.013	0.64 J	0.011	4.1 J	0.011	3.6 J	0.011	9.8 J	0.011

Note: Shaded values indicate analyte not detected at the Method Detection Limit. BOLD values exceed EPA PHA.
µg/L = micrograms per liter
CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors.
NL = not listed; an EPA PHA value has not been established for this analyte
PHA = Provisional Health Advisor (EPA memorandum, October 2009)
U = analyte not detected at the Method Detection Limit

Table 7 Perfluorinated Chemicals Detected in Soil at KC-135 Fire (Site 2)

		Sample Number	EAFB02-SB-001-001		EAFB02-SB-001-008		EAFB02-SB-002-001		EAFB02-SB-002-005		EAFB02-SB-003-003	
Analyte	CAS Number	EPA RSSL (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)
Perfluorobutanoic acid (PFBA)	375-22-4	NL	0.64 U	0.13	0.71 U	0.14	0.73 U	0.15	0.63 U	0.13	1.1	0.14
Perfluorodecane sulfonate (PFDS)	67906-42-7	NL	0.75 J	0.32	0.71 U	0.35	0.73 U	0.36	0.63 U	0.31	0.45 J	0.36
Perfluorodecanoic acid (PFDA)	335-76-2	NL	0.64 U	0.29	0.71 U	0.32	0.73 U	0.33	0.63 U	0.28	2.6	0.33
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.64 U	0.13	0.71 U	0.14	0.73 U	0.15	0.63 U	0.13	1.4	0.14
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	0.43 J	0.30	0.65 J	0.33	1.6	0.34	1.0	0.29	1.2	0.34
Perfluorohexanoic acid (PFHxA)	307-24-4	NL	0.64 U	0.16	0.21 J	0.18	0.73 U	0.18	0.63 U	0.16	2.3	0.18
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.64 U	0.23	0.71 U	0.26	4.1	0.27	1.0	0.23	1.5	0.26
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL	4.9	0.10	0.34 J	0.12	0.73 U	0.12	0.63 U	0.10	0.12 J	0.12
Perfluorooctane sulfonate (PFOS)	1763-23-1	6,000	2.3	0.15	14	0.17	140	0.17	120	0.15	30	0.17
Perfluorooctanoic acid (PFOA)	335-67-1	16,000	0.64 U	0.25	0.71 U	0.27	2.5	0.28	0.69 J	0.24	5.7	0.28
Perfluoropentanoic acid (PFPA)	2706-90-3	NL	0.64 U	0.26	0.36 J	0.28	0.73 U	0.29	0.63 U	0.25	3.0	0.29

Note: Shaded values indicate analyte not detected at the Method Detection Limit.
µg/kg = micrograms per kilogram
EPA = Environmental Protection Agency
NL = not listed
U = analyte not detected at the Method Detection Limit
CAS = Chemical Abstract Service
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
RSSL = Residential Soil Screening Level (EPA memorandum, November 2009)

Table 8 Environmental Samples Collected at the Former Ball Field Spray Area / Garrison Slough (Site 3)

Sample Identifier	Matrix	Purpose/Location
EAFB03-GW-002-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB03-SB-002, on east side of Taxiway F, between Hangar 1190 and Building 1206 (Fire Station) on the east side of the former ball field.
EAFB03-GW-MW33A-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing shallow monitoring well MW33A, on the east side of Taxiway F on the north side of the former ball field.
EAFB03-GW-MW33B-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from existing shallow monitoring well MW33B, on the east side of Taxiway F on the north side of the former ball field.
EAFB03-SB-001-001	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from surface soil on east side of Taxiway F between Hangars 1190 and 1206 in the middle of the former ball field.
EAFB03-SB-001-010	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected from subsurface soil (10 feet bgs) in DPT boring EAFB-SB-001 in the middle of the former ball field.
EAFB03-SB-002-010	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected from subsurface soil (10 feet bgs) in DPT boring EAFB-SB-002 on the east side of the former ball field.
EAFB03-SB-003-009	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected from subsurface soil (9 feet bgs) in DPT boring EAFB-SB-003 on the north side of the former ball field.
EAFB03-SB-004-010	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected from subsurface soil (10 feet bgs) in DPT boring EAFB-SB-004 on the west side of the former ball field.
EAFB03-SW-001-001/ EAFB03-SW-001-901 (Field Duplicate)	Surface water	Determine if PFCs remain in the surface water in Garrison Slough. Sample collected from the drainage channel where Garrison Slough passes under Central Avenue east of the former ball field.
EAFB03-SD-001-001/ EAFB03-SD-001-901 (Field Duplicate)	Sediment	Determine if PFCs remain in the sediment in Garrison Slough. Sample collected from the drainage channel where Garrison Slough passes under Central Avenue east of the former ball field.

bgs = below ground surface
DPT = direct push technology
PFC = perfluorinated chemical or compound

Table 9 Perfluorinated Chemicals Detected in Groundwater at the Former Ball Field Spray Area/Garrison Slough (Site 3)

			Sample Number	EAFB03-GW-002-000		EAFB03-GW-MW33A-000		EAFB03-GW-MW33B-000	
Analyte	CAS Number	EPA PHA (µg/L)	Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL	0.82 J	0.0083	2.4 J	0.0085	0.014 J	0.0079
Perfluorobutanoic acid (PFBA)	375-22-4	NL	0.67 J	0.0099	1.5 J	0.010	0.067 J	0.0095
Perfluorodecane sulfonate (PFDS)	67906-42-7	NL	0.010 J	0.0092	0.010 UJ	0.0094	0.014 J	0.0088
Perfluorodecanoic acid (PFDA)	335-76-2	NL	0.010 UJ	0.0079	0.010 UJ	0.0080	0.012 J	0.0075
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.23 J	0.013	4.2 J	0.014	0.021 J	0.013
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	1.3 J	0.0070	130 J	0.0072	0.45 J	0.0067
Perfluorohexanoic acid (PFHxA)	307-24-4	NL	3.1 J	0.0029	14 J	0.0030	0.060 J	0.0028
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.018 J	0.018	0.092 J	0.018	0.24 J	0.017
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL	0.026 J	0.0059	0.0095 J	0.0057	0.0090 J	0.0057
Perfluorooctane sulfonate (PFOS)	1763-23-1	0.2	**9.3 J**	0.013	**22 J**	0.014	**20 J**	0.013
Perfluorooctanoic acid (PFOA)	335-67-1	0.4	**0.40 J**	0.0099	**250 J**	0.010	0.095 J	0.0094
Perfluoropentanoic acid (PFPA)	2706-90-3	NL	2.3 J	0.011	5.3 J	0.011	0.068 J	0.011

Note: Shaded values indicate analyte not detected at the Method Detection Limit. **BOLD** values exceed EPA PHA.
µg/L = micrograms per liter
CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA PHA value has not been established for this analyte
PHA = Provisional Health Advisory (EPA memorandum, October 2009)
U = analyte not detected at the Method Detection Limit

Table 10 Perfluorinated Chemicals Detected in Soil at Former Ball Field Spray Area/Garrison Slough (Site 3)

			Sample Number	EAFB03-SB-001-001		EAFB03-SB-001-010		EAFB03-SB-002-010		EAFB03-SB-003-009		EAFB03-SB-004-010	
Analyte	**CAS Number**	**EPA RSSL (µg/kg)**		**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL		0.71 J	0.16	17	0.14	23	0.14	4.2	0.14	72	0.16
Perfluorobutanoic acid (PFBA)	375-22-4	NL		0.69 U	0.14	3.0	0.12	7.8	0.12	0.96	0.12	14	0.14
Perfluorodecane sulfonate (PFDS)	67906-42-7	NL		10	0.35	0.60 U	0.30	0.61 U	0.30	0.62 U	0.31	18	0.35
Perfluorodecanoic acid (PFDA)	335-76-2	NL		0.59 J	0.31	0.60 U	0.27	0.61 U	0.27	0.62 U	0.28	0.42 J	0.32
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL		0.72 J	0.14	1.9	0.12	4.0	0.12	1.4	0.12	6.8	0.14
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL		11	0.32	66	0.28	31	0.28	41	0.29	130	0.33
Perfluorohexanoic acid (PFHxA)	307-24-4	NL		2.2	0.17	29	0.15	53	0.15	30	0.15	140	0.18
Perfluorononanoic acid (PFNA)	375-95-1	NL		23 J	0.25	0.60 U	0.22	0.61 U	0.22	0.62 U	0.23	0.70 UJ	0.26
Perfluorooctane sulfonamide (FOSA)	754-91-6	NL		3.2	0.11	0.60 U	0.099	0.20 J	0.099	0.62 U	0.10	150	0.11
Perfluorooctane sulfonate (PFOS)	1763-23-1	6,000		5700 J	0.16	14	0.14	13	0.14	0.76 J	0.14	1400 J	0.16
Perfluorooctanoic acid (PFOA)	335-67-1	16,000		6.0	0.27	140	0.23	16	0.23	49	0.24	130	0.27
Perfluoropentanoic acid (PFPA)	2706-90-3	NL		0.84 J	0.28	10	0.24	18	0.24	2.8	0.25	50	0.28

Note: Shaded values indicate analyte not detected at the Method Detection Limit
µg/kg = micrograms per kilogram
CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA RSSL value has not been established for this analyte
RSSL = Residential Soil Screening Level (EPA memorandum, November 2009)
U = analyte not detected at the Method Detection Limit

Table 11 Perfluorinated Chemicals Detected in Sediment at Former Ball Field Spray Area/Garrison Slough (Site 3)

			Sample Number	EAFB03-SD-001-001
Analyte	CAS Number	EPA RSSL (µg/kg)	Result (µg/kg)	Reporting Limit (µg/kg)
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	0.36 J	0.32
Perfluorooctane sulfonate (PFOS)	1763-23-1	6,000	2.7	0.16

Note: Shaded values indicate analyte not detected at the Method Detection Limit.
µg/kg = micrograms per kilogram CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA RSSL value has not been established for this analyte
RSSL = Residential Soil Screening Level (EPA memorandum, November 2009)
U = analyte not detected at the Method Detection Limit

Table 12 Perfluorinated Chemicals Detected in Surface Water at Former Ball Field Spray Area/ Garrison Slough (Site 3)

			Sample Number	EAFB03-SW-001-001		EAFB03-SW-001-901 (Field Duplicate)	
Analyte	CAS Number	EPA PHA (µg/L)		Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL		0.15 J	0.0077	0.15 J	0.0077
Perfluorobutanoic acid (PFBA)	375-22-4	NL		0.067 J	0.0091	0.086 J	0.0092
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL		0.12 J	0.012	0.12 J	0.012
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL		1.2 J	0.0065	1.1 J	0.0065
Perfluorohexanoic acid (PFHxA)	307-24-4	NL		0.47 J	0.0027	0.49 J	0.0027
Perfluorooctane sulfonate (PFOS)	1763-23-1	0.2		**2.4 J**	0.012	**2.1 J**	0.012
Perfluorooctanoic acid (PFOA)	335-67-1	0.4		**0.53 J**	0.0091	**0.49 J**	0.0092
Perfluoropentanoic acid (PFPA)	2706-90-3	NL		0.21 J	0.010	0.21 J	0.010

Note: Shaded values indicate analyte not detected at the Method Detection Limit. **BOLD** values exceed EPA PHA.
µg/L = micrograms per liter CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA PHA value has not been established for this analyte
PHA = Provisional Health Advisor (EPA memorandum, October 2009)
U = analyte not detected at the Method Detection Limit

Table 13 Environmental Samples Collected at the Foamed Runway (Site 4)

Sample Identifier	Matrix	Purpose/Location
EAFB04-GW-001-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB04-SB-001 on the east side of Runway 14/32.
EAFB04-GW-002-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB04-SB-002 on the west side of Runway 14/32.
EAFB03-GW-003-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB04-SB-003 on the east side of Runway 14/32.
EAFB04-GW-004-000	Groundwater	Determine if PFCs are in the shallow groundwater. Sample collected from temporary well point in DPT boring EAFB04-SB-004 on the west side of Runway 14/32.
EAFB04-SB-001-001	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from DPT boring EAFB04-SB-001 on the east side of Runway 14/32.
EAFB04-SB-001-004	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at 4 feet bgs in DPT boring EAFB04-SB-001 on the east side of Runway 14/32.
EAFB04-SB-002-001	Surface soil	Determine if PFCs remain in the surface soil. Sample collected from DPT boring EAFB04-SB-002 on the west side of Runway 14/32.
EAFB04-SB-002-008	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at 8 feet bgs in DPT boring EAFB04-SB-002 on the west side of Runway 14/32.
EAFB04-SB-003-002	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at 2 feet bgs in DPT boring EAFB04-SB-003 on the east side of Runway 14/32.
EAFB04-SB-004-005	Subsurface soil	Determine if PFCs remain in the subsurface soil. Sample collected at 5 feet bgs in DPT boring EAFB04-SB-004 on the west side of Runway 14/32.

PFC = perfluorinated chemical or compound

bgs = below ground surface

DPT = direct push technology

PFC = perfluorinated chemical or compound

Table 14 Perfluorinated Chemicals Detected in Groundwater at the Foamed Runway (Site 4)

			Sample Number	EAFB04-GW-001-000		EAFB04-GW-002-000		EAFB04-GW-003-000		EAFB04-GW-004-000	
Analyte	CAS Number	EPA PHA (µg/L)		Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)	Result (µg/L)	Reporting Limit (µg/L)
Perfluorobutane sulfonate (PFBS)	29420-43-3	NL		0.0094 UJ	0.0086	0.011 UJ	0.0098	0.015 J	0.010	0.029 J	0.0076
Perfluorobutanoic acid (PFBA)	375-22-4	NL		0.010 UJ	0.010	0.012 UJ	0.012	0.10 J	0.012	0.055 J	0.0090
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL		0.018 J	0.014	0.027 J	0.016	0.081 J	0.016	0.27 J	0.012
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL		0.089 J	0.0073	0.059 J	0.0083	0.24 J	0.0085	0.31 J	0.0064
Perfluorohexanoic acid (PFHxA)	307-24-4	NL		0.026 J	0.0030	0.035 J	0.0034	0.74 J	0.0035	0.37 J	0.0027
Perfluorooctane sulfonate (PFOS)	1763-23-1	0.2		0.14 J	0.014	0.080 J	0.016	**0.29 J**	0.016	0.059 J	0.012
Perfluorooctanoic acid (PFOA)	335-67-1	0.4		0.021 J	0.010	0.032 J	0.012	0.030 J	0.012	0.069 J	0.0090
Perfluoropentanoic acid (PFPA)	2706-90-3	NL		0.028 J	0.011	0.037 J	0.013	0.064 J	0.013	0.22 J	0.010

Note: Shaded values indicate analyte not detected at the Method Detection Limit. **BOLD** values exceed EPA PHA.
µg/L = micrograms per liter
CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA PHA value has not been established for this analyte
PHA = Provisional Health Advisory (EPA memorandum, October 2009)
U = analyte not detected at the Method Detection Limit

Table 15 Perfluorinated Chemicals Detected in Soil at the Foamed Runway (Site 4)

Sample Number			EAFB04-SB-001-001		EAFB04-SB-001-004		EAFB04-SB-002-001		EAFB04-SB-002-008		EAFB04-SB-003-002		EAFB04-SB-004-005	
Analyte	**CAS Number**	**EPA RSSL (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**	**Result (µg/kg)**	**Reporting Limit (µg/kg)**
Perfluoroheptanoic acid (PFHpA)	375-85-9	NL	0.65 U	0.13	0.66 U	0.13	0.62 U	0.12	0.43 J	0.14	0.76 U	0.15	0.61 U	0.12
Perfluorohexane sulfonate (PFHxS)	108427-53-8	NL	0.65 U	0.30	0.66 U	0.31	1.9	0.29	1.7	0.33	0.37 J	0.35	0.61 U	0.28
Perfluorononanoic acid (PFNA)	375-95-1	NL	0.65 U	0.24	0.66 U	0.24	1.5	0.23	0.70 U	0.26	0.76 U	0.28	0.50 J	0.22
Perfluorooctane sulfonate (PFOS)	1763-23-1	6,000	0.78 J	0.15	0.66 U	0.15	15	0.14	0.70 U	0.16	0.76 U	0.18	3.3	0.14
Perfluorooctanoic acid (PFOA)	335-67-1	16,000	0.65 U	0.25	0.66 U	0.25	2.8	0.24	0.70 U	0.27	0.76 U	0.29	0.61 U	0.23

Note: Shaded values indicate analyte not detected at the Method Detection Limit
µg/kg = micrograms per kilogram
CAS = Chemical Abstract Service
EPA = Environmental Protection Agency
J = Estimated value; the analyte was positively identified, but the value is an estimate because of quantification factors
NL = not listed; an EPA RSSL value has not been established for this analyte
RSSL = Residential Soil Screening Level (EPA memorandum, November 2009)
U = analyte not detected at the Method Detection Limit

Appendix C

Boring Logs

1. HOLE NUMBER EAFB01-SB-001

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB01-SB-001

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED: b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14; b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 0.7 ft) 10YR 4/3, clay, brown, soft, wet to moist (0.7 to 6.0 ft) 10YR 4/3, silt, some fine grained sand, medium dense, wet at 1.5 feet	%	EAFB01-SB-001-001/ EAFB01-SB-001-901	Collect surface soil sample and field duplicate sample from 0 to 1 foot interval.
	2			%	EAFB01-SB-001-002/ EAFB01-SB-001-902	
	3			%		Wet at 1.5 feet. Collect subsurface soil sample and field duplicate from 1.0 to 2.0 foot interval.
	4					
	5			%		PID = 0 ppm
	6		(6.0 to 10.0 ft) 10YR 2/1 sand, black with 10 YR 9/2 gravel, and cobbles, poorly graded, wet	%		
	7					
	8			%		
	9					
			Total Depth= 10.0 feet	%		

1. HOLE NUMBER EAFB01-SB-002

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage
Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB01-SB-002

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE
[X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 5 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED | b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14 | b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 0.5 ft) Topsoil		EAFB01-SB-002-001	
	1		(0.5 to 5.0 ft) 10YR 4/3, sand, brown with quartz gravel, wet at 2.5 feet	%		Collect surface soil sample from 0 to 1 foot interval.
	2			%		Wet at 2.5 feet. Collect subsurface soil sample from 2.0 to 3.0 foot interval.
	3				EAFB01-SB-002-003	
	4			%		PID = 0 ppm
	5		Total Depth= 5.0 feet	%		
	6			%		
	7			%		
	8			%		
	9			%		

1. HOLE NUMBER EAFB01-SB-003

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB01-SB-003

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14; b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 1.5 ft) 10YR 4/1 to 10YR 4/3, strong brown sand with quartz gravel and cobbles, dense, moist	%	EAFB01-SB-003-001	Collect surface soil sample from 0 to 1 foot interval.
	2		(1.5 to 6.5 ft) 10YR 4/3, silt with brown, fine grained sand (10%), dense, moist, wet at 4 to 5 feet	%		
	3			%		PID = 0 ppm
	4					
	5			%		
	6			%		
	7		(6.5 to 7.4 ft) 5Y 2.5/1 silt, black, trace sand (5%), moist			EAFB01-SB-003-006
	8		(7.4 to 10.0 ft) 10YR 4/3 sand, brown with quartz cobbles, dense, wet	%		Wet at 6.5 feet. Collect subsurface soil sample from 6.0 to 7.0 foot interval.
	9			%		
			Total Depth= 10.0 feet			

1. HOLE NUMBER EAFB02-SB-001

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 2 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB02-SB-001

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 15 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/28/14; b. COMPLETED 7/28/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 0.3 ft) Topsoil			
	1		(0.3 to 6.0 ft) 7.5YR 4/2, brown sand with quartz rounded gravel, medium dense, moist, wet at 3.6 feet	%		
	2			%		
	3			%		PID = 0 ppm
	4					
	5			%		
	6		(6.0 to 10.0 ft) 7.5YR 8/1, white and 7.5YR 4/3 brown coarse sand with coarse gravel, dense, wet, wet at 8.5 feet	%		
	7					Water at approximately 8.5 feet. Collect soil sample from 7.5 to 8.5 foot interval.
	8			%	EAFB02-SB-001-008	
	9			%		

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 2 SHEETS
	EAFB02-SB-001	

3. PROJECT	4. INSTALLATION
Site Investigation AFFF Usage Various Air Force Bases	Eielson Air Force Base, AK

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			Drove well point to 15 feet. No soil samples	%		
	11			%		
	12			%		
	13			%		
	14			%		
	15		Total Depth = 15 feet	%		
	16			%		
	17			%		
	18			%		
	19			%		
	20			%		
	21			%		
	22			%		
	23			%		
	24			%		
	25			%		

1. HOLE NUMBER EAFB02-SB-002

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB02-SB-002

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED | b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14 | b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 0.2 ft) Topsoil		EAFB02-SB-002-001	
	1		(0.2 to 1.4 ft) 7.5YR 4/3, brown silt, dense, moist	%		Collect surface soil sample from 0 to 1 foot interval
	2		(1.4 to 5.0 ft) 7.5YR 8/1, white and 7.5YR 4/3 brown sand with coarse quartz gravel and cobbles, medium dense, moist	%		
	3			%		PID = 0 ppm
	4			%		Water at approximately 5 feet. Collect soil sample from 4 to 5 foot interval.
	5		(5.0 to 9.2 ft) Gravel and cobbles	%	EAFB02-SB-002-005	
	6			%		
	7			%		
	8			%		
	9		(9.2 to 9.7 ft) Wood (9.7 to 10.0 ft) Gravel and cobbles Total Depth = 10 feet	%		

1. HOLE NUMBER EAFB02-SB-003

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB02-SB-003

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 5 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED | b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14 | b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 2.0 ft) 7.5YR 4/3, brown silt, sandy, moist, firm	%		PID = 0 ppm
	2		(2.0 to 4.5 ft) 10YR 2/1, black fine grained sand, silty, dense, wet	%		Water at approximately 3 feet. Collect soil sample from 2 to 3 foot interval.
	3			%	EAFB02-SB-003-003	
	4		(4.5 to 5.0 ft) 10YR 2/1 black fine grained sand with quartz gravel, wet			
	5		Total Depth= 5.0 feet	%		
	6			%		
	7					
	8			%		
	9			%		

1. HOLE NUMBER EAFB03-SB-001

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 2 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB03-SB-001

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 15 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14; b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR: Jody Bach

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 3.0 ft) 10YR 4/3, brown fine grained sand with silt (15%), medium dense, moist	%	EAFB03-SB-001-001	Collect surface soil sample from 0 to 1 foot interval
	1					
	2			%		
	3		(3.0 to 4.8 ft) 10YR 4/3, brown fine grained sand with silt (15%) and quartz fine grained rounded gravel, medium dense, moist	%		PID = 0 ppm
	4					
	5		(4.8 to 5.2 ft) 7.5YR 4/6, strong brown silt, clayey	%		
	6		(5.2 to 8.1 ft) 10YR 4/3, brown fine grained sand, medium dense, moist	%		
	7					
	8			%		
	9		(8.2 to 10.0 ft) 10YR 8/1, white and 10YR 5/3, brown sand with coarse grained gravel and cobbles, medium dense, moist	%	EAFB03-SB-001-010	Water at approximately 10 feet. Collect soil sample from 9 to 10 foot interval.

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 2 SHEETS
	EAFB03-SB-001	

3. PROJECT Site Investigation AFFF Usage Various Air Force Bases

4. INSTALLATION Eielson Air Force Base, AK

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	11		(10.0 to 15.0 ft) 10YR 4/3, brown quartz gravel and cobbles with sand, dense, wet	%		PID = 0 ppm
	12			%		
	13			%		
	14					
	15		Total Depth = 15 feet	%		
	16			%		
	17					
	18			%		
	19			%		
	20					
	21			%		
	22			%		
	23					
	24			%		
	25			%		

1. HOLE NUMBER EAFB03-SB-002

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB03-SB-002

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED | b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/28/14 | b. COMPLETED 7/28/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 0.8 ft) 7.5YR 4/3, brown, sand,with silt (20%) loose, moist	%		
	2		(0.8 to 4.3 ft) 7.5YR 4/3, brown sand with quartz rounded gravel	%		
	3					PID = 0 ppm
	4		(4.3 to 5.0 ft) 7.5YR 8/1, white coarse sand with coarse rounded gravel (20%), loose, moist	%		
	5			%		
	6		(5.0 to 8.2 ft) 7.5YR 4/3, brown silt with fine sand, medium dense, moist	%		
	7					PID = 0 ppm
	8		(8.2 to 10.0 ft) 7.5YR 8/1, white and 7.5YR 4/3 brown sand with fine rounded	%		
	9		quartz gravel, moist, wet at 9.7 feet	%		Water at approximately 9.7 feet. Collect soil sample from 8.7 to 9.7 foot interval.
			Total Depth = 10 feet		EAFB03-SB-002-010	

1. HOLE NUMBER EAFB03-SB-003

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 2 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB03-SB-003

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 15 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/28/14; b. COMPLETED 7/28/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 4.5 ft) 7.5YR 4/3, Brown, sand,with silt (20%) loose, moist	%		
	2			%		
	3					PID = 0 ppm
	4			%		
	5		(4.5 to 7.5 ft) 7.5YR 4/3, brown sand with fine quartz rounded gravel (10%), medium dense, moist	%		
	6			%		
	7					PID = 0 ppm
	8		(7.5 to 9.3 ft) 7.5YR 8/1, white coarse sand with coarse rounded gravel (20%), loose, moist	%		Water at approximately 9.3 feet. Collect soil sample from 8 to 9 foot interval.
	9			%	EAFB03-SB003-009	

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 2 SHEETS
	EAFB03-SB-003	

3. PROJECT	4. INSTALLATION
Site Investigation AFFF Usage Various Air Force Bases	Eielson Air Force Base, AK

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	11		(9.3 to 15.0 ft) 7.5YR 5/6, strong brown quartz gravel, wet, loose, with sand (15%)	%		PID = 0 ppm
	12			%		
	13			%		
	14					
	15		Total Depth = 15 feet	%		
	16			%		
	17					
	18			%		
	19			%		
	20			%		
	21					
	22			%		
	23			%		
	24					
	25			%		

1. HOLE NUMBER EAFB03-SB-004

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 2 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB03-SB-004

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 15 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/28/14; b. COMPLETED 7/28/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 8.4 ft) 7.5YR 4/3, Brown, fine sand,with coarse (10%) quartz and granitic gravel, sub-angular, loose, moist	%		
	2			%		
	3					PID = 0 ppm
	4			%		
	5			%		
	6			%		
	7		(8.4 to 9.6 ft) 7.5YR 8/1,white coarse sand with fine (10%) quartz gravel, rounded, moist medium dense			PID = 0 ppm
	8			%		
	9		(9.6 to 10.2 ft) 7.5YR 4/3, Brown fine sand with coarse (10%) quartz granitic sand and subangular gravel, medium dense, moist	%	EAFB03-SB004-010	Water at approximately 10 feet. Collect soil sample from 9 to 10 foot interval.

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: EAFB03-SB-004

SHEET 2 OF 2 SHEETS

3. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

4. INSTALLATION: Eielson Air Force Base, AK

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	11		(9.6 to 10.2 ft) 7.5YR 4/3, Brown fine sand with coarse (10%) quartz granitic sand and subangular gravel, medium dense, moist	%		
	12		(10.2 to 15.0 ft) 7.5YR 5/6, Strong brown quartz gravel with sand, wet, loose	%		PID = 0 ppm
	13			%		
	14					
	15		Total Depth = 15 feet	%		
	16			%		
	17					
	18			%		
	19			%		
	20			%		
	21					
	22			%		
	23			%		
	24					
	25			%		

1. HOLE NUMBER EAFB04-SB-001

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage
Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB04-SB-001

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE
[X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 5 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14; b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 5.0 ft) 7.5YR 4/3, sand brown with quartz gravel and pebbles, moist to wet at 3.8 feet	%	EAFB04-SB-001-001	Collect surface soil sample from 0 to 1.0 foot interval.
	1			%		PID = 0 ppm
	2			%		Wet at 3.8 feet. Collect subsurface soil sample from 3.0 to 4.0 foot interval.
	3			%	EAFB04-SB-001-004	
	4			%		
	5		Total Depth= 5.0 feet	%		
	6			%		
	7			%		
	8			%		
	9			%		

1. HOLE NUMBER EAFB04-SB-002

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DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB04-SB-002

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 2

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/30/14; b. COMPLETED 7/30/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 8.2 ft) 10YR 6/4, sand (SW), light brown, wet at 7.5 feet, fine grained, moist, dense with quartz gravel and pebbles, moist to wet at 3.8 feet		EAFB04-SB-002-001	
	1			%		Collect surface soil sample from 0 to 1.0 foot interval.
	2			%		
	3			%		
	4					PID = 0 ppm
	5			%		
	6			%		
	7					Wet at 7.5 feet. Collect subsurface soil sample from 7.0 to 8.0 foot interval.
	8		(8.2 to 10.0 ft) 10YR 4/34, gravel, brown with sand, wet, dense	%	EAFB04-SB-002-008	
	9		Total Depth= 10.0 feet			

1. HOLE NUMBER EAFB04-SB-003

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB04-SB-003

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 5 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/29/14; b. COMPLETED 7/29/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			(0 to 0.3 ft) Topsoil			
	1		(0.3 to 2.7 ft) 10YR 5/4, silt, brown, from moist to wet at 1.7 feet	%		
	2			%		Wet at 1.7 feet. Collect subsurface soil sample from 1.0 to 2.0 foot interval.
	3		(2.7 to 5.0 ft) 10YR 5/4, yellowish brown sand with quartz cobbles and gravel (25%), dense, wet	%	EAFB04-SB-003-002	PID = 0 ppm
	4					
	5		Total Depth= 5.0 feet	%		
	6			%		
	7					
	8			%		
	9			%		

1. HOLE NUMBER EAFB04-SB-004

Print Form | E-mail

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: Eielson AFB, AK

SHEET 1 OF 1 SHEETS

4. PROJECT: Site Investigation AFFF Usage Various Air Force Bases

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: Geotec Alaska, Inc.

7. HOLE NUMBER *(as shown on drawing title and title number)*: EAFB04-SB-004

8. NAME OF DRILLER: Glen Rawson

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: NA

11. DEPTH DRILLED INTO ROCK: NA

12. TOTAL DEPTH OF HOLE: 10 feet

13. SIZE AND TYPE OF BIT: Geoprobe Macrocore (2-inch)

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED; b. UNDISTURBED: 1

17. TOTAL NUMBER CORE BOXES: NA

18. ELEVATION GROUND WATER

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 7/30/14; b. COMPLETED 7/30/14

20. ELEVATION TOP OF HOLE *(feet)*

21. TOTAL CORE RECOVERY FOR BORING %: 100

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		(0 to 3.5 ft) 10YR 6/4, sand (SW), light brown, fine grained, moist, dense	%		
	2			%		PID = 0 ppm
	3			%		
	4		(3.5 to 10.0 ft) 10YR 8/1 to 10YR 4/3, sand and quartz gravel cobbles, brown, poorly graded, dense, moist, wet at 5.0 feet			Wet at 5.0 feet. Collect subsurface soil sample from 4.0 to 5.0 foot interval.
	5			%	EAFB04-SB-004-005	
	6			%		
	7			%		
	8			%		
	9			%		
			Total Depth= 10.0 feet			

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

PROJECT: Site Investigation AFFF Usage at Various Air Force Bases

HOLE NUMBER: EAFB04-SB-004

VERSION 1.0

Appendix D

Laboratory Case Narratives and

Data Validation Report with Analytical Tables

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

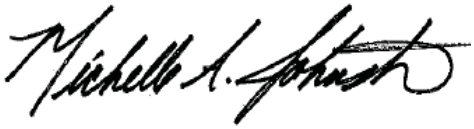
Job Number: 280-58521-1

SDG Number: Eielson

Job Description: Air Force Multi - Base PFC Investigation

For:
SES Construction & Fuel Services, LLC
1006 Floyd Culler Court
Oak Ridge, TN 37830

Attention: Doug Hawn



Approved for release.
Michelle A Johnston
Project Manager II
8/27/2014 4:08 PM

Michelle A Johnston, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0110
michelle.johnston@testamericainc.com
08/27/2014

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is E87667.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

CASE NARRATIVE
Client: SES Construction and Fuel Services LLC
Project: Air Force Multi - Base PFC Investigation - Eielson
Report Number: 280-58521-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The PFC method DV-LC-0012 is an isotope dilution method; therefore, the internal standards are added prior to the extraction process. This technique inherently corrects for variability in the extraction efficiency due to sample matrix. Dilution of samples beyond the ability of the instrument to detect the internal standards is not recommended. Analyses performed at a dilution level requiring additional internal standard to be added after the extraction step in order to quantitate results has been shown to yield results with a significant low bias. As a result, data have been reported that exceed the calibration range and are qualified as estimated.

The PFC method is an isotope dilution method where the internal standards are added prior to extraction and used to quantitate results; therefore, the use of dilution factors is inappropriate. Application of dilution factors would yield results that are artificially high. Reporting limits and method detection limits are not adjusted for dilutions unless samples are fortified with additional internal standard, which is not recommended.

Internal standard abundances may vary depending upon both recovery and the dilution at which the analysis is performed. This is an inherent feature of the isotope dilution technique and is not indicative of bias to the reported results.

Sample Receipt

The following report contains the analytical results for twenty-two samples received August 4, 2014, according to documented sample acceptance procedures. The samples were received at temperatures of 6.1°C and 14.2°C.

Samples 280-58521-12 through -22 were received at the laboratory intact, but at an elevated temperature of 14.2°C. The client was notified on August 4, 2014.

The samples collected on 07/28/2014 were received at the laboratory on the 7th day of the 7 day holding time. All other samples were received with less than half of the holding time remaining. It is TestAmerica's policy to analyze all samples within holding times; however, the laboratory cannot guarantee that hold times will be met when samples are received with less than half the hold time remaining.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFC)

Samples EAFB02-GW-MW30-000 (280-58521-1), EAFB02-GW-MW32-000 (280-58521-2), EAFB03-GW-MW33B-000 (280-58521-3), EAFB02-GW-001-000 (280-58521-4), EAFB03-GW-MW33A-000 (280-58521-5), EAFB03-GW-002-000 (280-58521-6), EAFB02-GW-002-000 (280-58521-7), EAFB02-GW-003-000 (280-58521-8), EAFB01-GW-53M04B-000 (280-58521-9), EAFB01-GW-20M14B-000 (280-58521-10), EAFB01-GW-001-000 (280-58521-11), EAFB04-GW-003-000 (280-58521-12), EAFB04-GW-001-000 (280-58521-13), EAFB01-GW-20MW32-000 (280-58521-14), EAFB01-GW-20MW32-900 (280-58521-15), EAFB-RS-01 (280-58521-16), EAFB-RS-02 (280-58521-17), EAFB-RS-03 (280-58521-18), EAFB04-GW-002-000 (280-58521-19), EAFB04-GW-004-000 (280-58521-20), EAFB03-SW-001-001 (280-58521-21) and EAFB03-SW-001-901 (280-58521-22) were analyzed for PFC in accordance with SOP DV-LC-0012. The samples were prepared on 08/06/2014 and 08/07/2014 and analyzed on 08/22/2014.

Reporting limits and method detection limits have been adjusted accordingly for the initial volumes extracted.

During the solid phase extraction process, samples EAFB02-GW-001-000 (280-58521-4) and EAFB04-GW-003-000 (280-58521-12) clogged the cartridge; therefore, a weigh back was used to complete the extraction. Surrogate and spike amounts have been adjusted for the volumes extracted.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to analytes present above the calibration range, several samples had to be analyzed at dilutions as outlined below.

EAFB02-GW-MW30-000 (280-58521-1) 2X for Run Type DL
EAFB02-GW-MW32-000 (280-58521-2) 50X for Run Type DL
EAFB03-GW-MW33B-000 (280-58521-3) 20X for Run Type DL
EAFB02-GW-001-000 (280-58521-4) 20X for Run Type DL
EAFB03-GW-MW33A-000 (280-58521-5) 50X for Run Type DL
EAFB03-GW-002-000 (280-58521-6) 10X for Run Type DL

EAFB02-GW-002-000 (280-58521-7) 5X for Run Type DL
EAFB02-GW-003-000 (280-58521-8) 20X for Run Type DL
EAFB01-GW-53M04B-000 (280-58521-9) 2X for Run Type DL
EAFB01-GW-20M14B-000 (280-58521-10) 10X for Run Type DL

Internal standards (IS) were not fortified, therefore, the IS percent recoveries need to be multiplied by 2, 5, 10, 20 or 50 and the MDLs/RLs were not updated due to limitations in the software. Internal standards and surrogate recoveries in the diluted analyses may have recovered outside the control limits as a result of the dilutions.

Results for samples EAFB02-GW-MW32-000 (280-58521-2) and EAFB03-GW-MW33A-000 (280-58521-5) were above the upper calibration limit. The samples were diluted 50X in an attempt to bring the results within the calibration range; however, some analytes are still above the upper calibration limit. Further dilution would result in very low response for the associated internal standards and unreliable quantitation; therefore, the results reported as estimated and flagged “J”.

Surrogate 13C8 PFOS was recovered above the QC limits in samples EAFB02-GW-MW32-000 (280-58521-2) and EAFB03-GW-MW33A-000 (280-58521-5). These anomalies are due to obvious matrix interferences; therefore, corrective action is deemed unnecessary. The associated data have been flagged “Q” in accordance with the DoD QSM.

Several samples were extracted outside the laboratory’s recommended holding time as the samples were received at the laboratory with less than one half the holding times remaining. The scientific literature indicates PFCs are highly persistent compounds in the environment. TestAmerica Denver has conducted stability studies indicating medium- and low-level standard solutions of PFOA are stable for at least three months in glass, polystyrene, and polypropylene plastics at 0-6°C. The 7-day/40-day holding times are based on the general EPA convention for the holding time of extractable organic compounds in water.

MS/MSD analyses for prep batch 280-237835 were not requested.

The MS/MSD associated with prep batch 280-237662 was performed on sample EAFB01-GW-20MW32-000 (280-58521-14). The MS/MSD exhibited spike compound recoveries and RPD data outside the control limits for several compounds. In addition, the MS/MSD spike compound recoveries and RPD data could not be reliably calculated for PFHxS and PFOS because the sample concentrations were greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample have been flagged “J” in accordance with the DoD QSM.

The second MS/MSD associated with prep batch 280-237662 was performed on sample EAFB03-SW-001-001 (280-58521-21). The MS/MSD exhibited spike compound recoveries outside the control limits for several compounds. In addition, the MS/MSD spike compound recoveries and RPD data could not be reliably calculated for PFHxS and PFOS because the sample concentrations were greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample have been flagged “J” in accordance with the DoD QSM.

Internal standard responses were outside the control limits for samples EAFB02-GW-MW30-000 (280-58521-1), EAFB02-GW-MW32-000 (280-58521-2), EAFB03-GW-MW33B-000 (280-58521-3), EAFB02-GW-001-000 (280-58521-4), EAFB03-GW-MW33A-000 (280-58521-5), EAFB02-GW-003-000 (280-58521-8), EAFB01-GW-53M04B-000 (280-58521-9), EAFB04-GW-003-000 (280-58521-12), EAFB01-GW-20MW32-900 (280-58521-15), EAFB-RS-01 (280-58521-16), EAFB04-GW-002-000 (280-58521-19), EAFB03-SW-001-001 (280-58521-21), EAFB03-SW-001-001 (280-58521-21 MS) and EAFB03-SW-001-901 (280-58521-22). The samples show evidence of matrix interference. The internal standards were in control for the Method Blank, LCS and LCSD, indicating that the sample matrix may be causing the internal standard outages.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Perfluorooctane Sulfonamide (FOSA)

Samples EAFB02-GW-MW30-000 (280-58521-1), EAFB02-GW-MW32-000 (280-58521-2), EAFB03-GW-MW33B-000 (280-58521-3), EAFB02-GW-001-000 (280-58521-4), EAFB03-GW-MW33A-000 (280-58521-5), EAFB03-GW-002-000 (280-58521-6), EAFB02-GW-002-000 (280-58521-7), EAFB02-GW-003-000 (280-58521-8), EAFB01-GW-53M04B-000 (280-58521-9), EAFB01-GW-20M14B-000 (280-58521-10), EAFB01-GW-001-000 (280-58521-11), EAFB04-GW-003-000 (280-58521-12), EAFB04-GW-001-000 (280-58521-13), EAFB01-GW-20MW32-000 (280-58521-14), EAFB01-GW-20MW32-900 (280-58521-15), EAFB-RS-01 (280-58521-16), EAFB-RS-02 (280-58521-17), EAFB-RS-03 (280-58521-18), EAFB04-GW-002-000 (280-58521-19), EAFB04-GW-004-000 (280-58521-20), EAFB03-SW-001-001 (280-58521-21) and EAFB03-SW-001-901 (280-58521-22) were analyzed for FOSA in accordance with SOP DV-LC-0012. The samples were prepared on 08/06/2014 and 08/07/2014 and analyzed on 08/07/2014 and 08/08/2014.

Reporting limits and method detection limits have been adjusted accordingly for the initial volumes extracted.

During the solid phase extraction process, samples EAFB02-GW-001-000 (280-58521-4), EAFB01-GW-53M04B-000 (280-58521-9), EAFB04-GW-001-000 (280-58521-13), EAFB01-GW-20MW32-000 (280-58521-14 MS), EAFB01-GW-20MW32-000 (280-58521-14 MSD) and EAFB04-GW-004-000 (280-58521-20) clogged the cartridge; therefore, a weigh back was used to complete the extraction. Surrogate and spike amounts have been adjusted for the volumes extracted.

Several samples were extracted outside the laboratory’s recommended holding time as the samples were received at the laboratory with less than one half the holding times remaining. The scientific literature indicates PFCs are highly persistent compounds in the

environment. TestAmerica Denver has conducted stability studies indicating medium- and low-level standard solutions of PFOA are stable for at least three months in glass, polystyrene, and polypropylene plastics at 0-6°C. The 7-day/40-day holding times are based on the general EPA convention for the holding time of extractable organic compounds in water.

MS/MSD analyses for prep batch 280-237840 were not requested.

Internal standard responses were outside the control limits for samples EAFB02-GW-001-000 (280-58521-4), EAFB01-GW-001-000 (280-58521-11), EAFB01-GW-20MW32-000 (280-58521-14), EAFB01-GW-20MW32-000 (280-58521-14 MS), EAFB01-GW-20MW32-000 (280-58521-14 MSD), EAFB01-GW-20MW32-900 (280-58521-15), EAFB04-GW-002-000 (280-58521-19) and EAFB04-GW-004-000 (280-58521-20). The samples show evidence of matrix interference. The internal standards were in control for the Method Blank, LCS and LCSD, indicating that the sample matrix may be causing the internal standard outages.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

SAMPLE SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-58521-1	EAFB02-GW-MW30-000	Water	07/28/2014 1230	08/04/2014 0955
280-58521-2	EAFB02-GW-MW32-000	Water	07/28/2014 1330	08/04/2014 0955
280-58521-3	EAFB03-GW-MW33B-000	Water	07/28/2014 1440	08/04/2014 0955
280-58521-4	EAFB02-GW-001-000	Water	07/28/2014 1440	08/04/2014 0955
280-58521-5	EAFB03-GW-MW33A-000	Water	07/29/2014 0945	08/04/2014 0955
280-58521-6	EAFB03-GW-002-000	Water	07/29/2014 1005	08/04/2014 0955
280-58521-7	EAFB02-GW-002-000	Water	07/29/2014 1130	08/04/2014 0955
280-58521-8	EAFB02-GW-003-000	Water	07/29/2014 1220	08/04/2014 0955
280-58521-9	EAFB01-GW-53M04B-000	Water	07/29/2014 1450	08/04/2014 0955
280-58521-10	EAFB01-GW-20M14B-000	Water	07/29/2014 1550	08/04/2014 0955
280-58521-11	EAFB01-GW-001-000	Water	07/29/2014 1455	08/04/2014 0955
280-58521-12	EAFB04-GW-003-000	Water	07/29/2014 1705	08/04/2014 0955
280-58521-13	EAFB04-GW-001-000	Water	07/29/2014 1745	08/04/2014 0955
280-58521-14	EAFB01-GW-20MW32-000	Water	07/30/2014 1040	08/04/2014 0955
280-58521-14MS	EAFB01-GW-20MW32-000	Water	07/30/2014 1040	08/04/2014 0955
280-58521-14MSD	EAFB01-GW-20MW32-000	Water	07/30/2014 1040	08/04/2014 0955
280-58521-15	EAFB01-GW-20MW32-900	Water	07/30/2014 1045	08/04/2014 0955
280-58521-16	EAFB-RS-01	Water	07/30/2014 1250	08/04/2014 0955
280-58521-17	EAFB-RS-02	Water	07/30/2014 1300	08/04/2014 0955
280-58521-18	EAFB-RS-03	Water	07/30/2014 1310	08/04/2014 0955
280-58521-19	EAFB04-GW-002-000	Water	07/30/2014 1300	08/04/2014 0955
280-58521-20	EAFB04-GW-004-000	Water	07/30/2014 1405	08/04/2014 0955
280-58521-21	EAFB03-SW-001-001	Water	07/30/2014 1515	08/04/2014 0955
280-58521-21MS	EAFB03-SW-001-001	Water	07/30/2014 1515	08/04/2014 0955
280-58521-21MSD	EAFB03-SW-001-001	Water	07/30/2014 1515	08/04/2014 0955
280-58521-22	EAFB03-SW-001-901	Water	07/30/2014 1519	08/04/2014 0955

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-1	**EAFB02-GW-MW30-000**					
Perfluorobutane Sulfonate (PFBS)		0.83	H	0.020	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.92	H	0.020	ug/L	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.022	H M	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		2.5	H	0.030	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		20	H	0.030	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		4.7	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.42	H	0.040	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		82	H M	0.030	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		3.5	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		3.6	H	0.030	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.016	J H	0.051	ug/L	PFC -FOSA
280-58521-2	**EAFB02-GW-MW32-000**					
Perfluorobutane Sulfonate (PFBS)		1.3	H Q	0.020	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		3.1	H	0.020	ug/L	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.86	H Q	0.020	ug/L	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.32	H	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		4.0	H	0.030	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		31	H Q	0.030	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		25	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.33	H	0.040	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2000	H J Q	0.030	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		18	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		9.8	H	0.030	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.83	H	0.048	ug/L	PFC -FOSA
280-58521-3	**EAFB03-GW-MW33B-000**					
Perfluorobutane Sulfonate (PFBS)		0.014	J H	0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.067	H	0.019	ug/L	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.014	J H	0.019	ug/L	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.012	J H	0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.021	J H	0.029	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.45	H	0.029	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.060	H	0.019	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.24	H	0.039	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		20	H	0.029	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.095	H	0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.068	H	0.029	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.0090	J H	0.050	ug/L	PFC -FOSA

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-4	**EAFB02-GW-001-000**					
Perfluorobutane Sulfonate (PFBS)		0.20	H	0.024	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.35	H	0.024	ug/L	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.0098	J H	0.024	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.52	H	0.036	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		5.9	H Q	0.036	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		2.1	H	0.024	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.057	H	0.048	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		30	H Q	0.036	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		1.6	H	0.024	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		1.4	H	0.036	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.051	J H	0.36	ug/L	PFC -FOSA
280-58521-5	**EAFB03-GW-MW33A-000**					
Perfluorobutane Sulfonate (PFBS)		2.4	H	0.021	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		1.5	H	0.021	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		4.2	H	0.031	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		130	H J	0.031	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		14	H	0.021	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.092	H M	0.041	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		22	H M	0.031	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		250	H J	0.021	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		5.3	H	0.031	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.0095	J H	0.050	ug/L	PFC -FOSA
280-58521-6	**EAFB03-GW-002-000**					
Perfluorobutane Sulfonate (PFBS)		0.82	H	0.020	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.67	H	0.020	ug/L	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.010	J H	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.23	H	0.030	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.3	H	0.030	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		3.1	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.018	J H	0.040	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		9.3	H	0.030	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.40	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		2.3	H	0.030	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.026	J H	0.051	ug/L	PFC -FOSA

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-7	**EAFB02-GW-002-000**					
Perfluorobutane Sulfonate (PFBS)		0.057	H	0.020	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.18	H	0.020	ug/L	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.017	J H	0.020	ug/L	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.030	H	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.43	H	0.031	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.8	H	0.031	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.61	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.089	H	0.041	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		6.7	H	0.031	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.77	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.64	H	0.031	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.072	H	0.053	ug/L	PFC -FOSA
280-58521-8	**EAFB02-GW-003-000**					
Perfluorobutane Sulfonate (PFBS)		0.050	H	0.020	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		1.2	H	0.020	ug/L	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.035	H	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		2.5	H	0.030	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.2	H	0.030	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		2.5	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.39	H	0.040	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		23	H Q	0.030	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		3.3	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		4.1	H	0.030	ug/L	DV-LC-0012
280-58521-9	**EAFB01-GW-53M04B-000**					
Perfluorobutane Sulfonate (PFBS)		0.20	H	0.020	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.96	H	0.029	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		2.5	H	0.029	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		1.9	H	0.020	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.018	J H	0.039	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2.0	H	0.029	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		1.1	H	0.020	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		1.5	H	0.029	ug/L	DV-LC-0012

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-10	**EAFB01-GW-20M14B-000**					
Perfluorobutane Sulfonate (PFBS)		0.21	H	0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.14	H	0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.25	H	0.029	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		4.4	H	0.029	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.77	H	0.019	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		9.7	H	0.029	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.76	H	0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.46	H	0.029	ug/L	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.019	J H	0.050	ug/L	PFC -FOSA
280-58521-11	**EAFB01-GW-001-000**					
Perfluorohexane Sulfonate (PFHxS)		0.022	J H	0.031	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.051	H	0.021	ug/L	DV-LC-0012
280-58521-12	**EAFB04-GW-003-000**					
Perfluorobutane Sulfonate (PFBS)		0.015	J H	0.024	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.10	H	0.024	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.081	H	0.037	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.24	H	0.037	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.74	H	0.024	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.29	H	0.037	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.030	H	0.024	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.064	H	0.037	ug/L	DV-LC-0012
280-58521-13	**EAFB04-GW-001-000**					
Perfluoroheptanoic acid (PFHpA)		0.018	J H	0.031	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.089	H	0.031	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.026	H	0.021	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.14	H	0.031	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.021	H	0.021	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.028	J H	0.031	ug/L	DV-LC-0012

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-14	**EAFB01-GW-20MW32-000**					
Perfluorobutane Sulfonate (PFBS)		0.037	J	0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.12	J	0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.41	J	0.029	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.3	J	0.029	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.46	J	0.019	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.055	J	0.038	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		1.5	J	0.029	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.69	J	0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.34	J	0.029	ug/L	DV-LC-0012
280-58521-15	**EAFB01-GW-20MW32-900**					
Perfluorobutane Sulfonate (PFBS)		0.025		0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.063		0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.23		0.029	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.83		0.029	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.23		0.019	ug/L	DV-LC-0012
Perfluorononanoic acid (PFNA)		0.033	J	0.038	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.93		0.029	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.39		0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.17		0.029	ug/L	DV-LC-0012
280-58521-19	**EAFB04-GW-002-000**					
Perfluoroheptanoic acid (PFHpA)		0.027	J	0.036	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.059		0.036	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.035		0.024	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.080		0.036	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.032		0.024	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.037		0.036	ug/L	DV-LC-0012
280-58521-20	**EAFB04-GW-004-000**					
Perfluorobutane Sulfonate (PFBS)		0.029		0.018	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.055		0.018	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.27		0.028	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.31		0.028	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.37		0.018	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.059		0.028	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.069		0.018	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.22		0.028	ug/L	DV-LC-0012

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58521-21	**EAFB03-SW-001-001**					
Perfluorobutane Sulfonate (PFBS)		0.15	J	0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.067	M	0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.12	J	0.028	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.2	J	0.028	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.47		0.019	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2.4	J	0.028	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.53	J	0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.21		0.028	ug/L	DV-LC-0012
280-58521-22	**EAFB03-SW-001-901**					
Perfluorobutane Sulfonate (PFBS)		0.15		0.019	ug/L	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.086		0.019	ug/L	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.12		0.028	ug/L	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.1		0.028	ug/L	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.49		0.019	ug/L	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2.1		0.028	ug/L	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.49		0.019	ug/L	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.21		0.028	ug/L	DV-LC-0012

METHOD SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Perfluorinated Hydrocarbons	TAL DEN	TAL-DEN DV-LC-0012	
Solid-Phase Extraction (SPE)	TAL DEN		SW846 3535
FOSA in Water (LC/MS/MS)	TAL DEN	TAL-DEN PFC -FOSA	
Solid-Phase Extraction (SPE)	TAL DEN		SW846 3535

Lab References:

TAL DEN = TestAmerica Denver

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-DEN = TestAmerica Laboratories, Denver, Facility Standard Operating Procedure.

DATA REPORTING QUALIFIERS

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Lab Section	Qualifier	Description
LCMS		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
	M	Manual integrated compound.
	4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
	Q	One or more quality control criteria failed.
	D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
	H	Sample was prepped or analyzed beyond the specified holding time
	U	Undetected at the Limit of Detection.

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ANALYTICAL REPORT

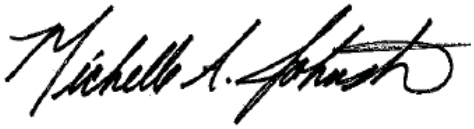
Job Number: 280-58523-1

SDG Number: Eielson

Job Description: Air Force Multi - Base PFC Investigation

For:
SES Construction & Fuel Services, LLC
1006 Floyd Culler Court
Oak Ridge, TN 37830

Attention: Doug Hawn



Approved for release.
Michelle A Johnston
Project Manager II
8/27/2014 4:25 PM

Michelle A Johnston, Project Manager II
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08/27/2014

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is E87667.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

CASE NARRATIVE
Client: SES Construction and Fuel Services LLC
Project: Air Force Multi - Base PFC Investigation - Eielson
Report Number: 280-58523-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The PFC method DV-LC-0012 is an isotope dilution method; therefore, the internal standards are added prior to the extraction process. This technique inherently corrects for variability in the extraction efficiency due to sample matrix. Dilution of samples beyond the ability of the instrument to detect the internal standards is not recommended. Analyses performed at a dilution level requiring additional internal standard to be added after the extraction step in order to quantitate results has been shown to yield results with a significant low bias. As a result, data have been reported that exceed the calibration range and are qualified as estimated.

The PFC method is an isotope dilution method where the internal standards are added prior to extraction and used to quantitate results; therefore, the use of dilution factors is inappropriate. Application of dilution factors would yield results that are artificially high. Reporting limits and method detection limits are not adjusted for dilutions unless samples are fortified with additional internal standard, which is not recommended.

Internal standard abundances may vary depending upon both recovery and the dilution at which the analysis is performed. This is an inherent feature of the isotope dilution technique and is not indicative of bias to the reported results.

Sample Receipt

The following report contains the analytical results for twenty-five samples received August 4, 2014, according to documented sample acceptance procedures. The samples were received at temperatures of 4.8°C and 0.5°C.

In accordance with the client's instructions provided on August 8, 2014, all analyses for sample EAFB03-SD-001-901 (280-58523-26) were cancelled. The sample was water and rocks.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFC)

Samples EAFB03-SB-001-001 (280-58523-1), EAFB03-SB-004-010 (280-58523-2), EAFB03-SB-003-009 (280-58523-3), EAFB03-SB-002-010 (280-58523-4), EAFB02-SB-001-001 (280-58523-5), EAFB02-SB-001-008 (280-58523-6), EAFB02-SB-002-001 (280-58523-7), EAFB02-SB-002-005 (280-58523-8), EAFB02-SB-003-003 (280-58523-9), EAFB01-SB-003-001 (280-58523-10), EAFB01-SB-003-006 (280-58523-11), EAFB01-SB-001-001 (280-58523-12), EAFB01-SB-001-901 (280-58523-13), EAFB01-SB-001-002 (280-58523-14), EAFB01-SB-001-902 (280-58523-15), EAFB03-SB-001-010 (280-58523-16), EAFB01-SB-002-001 (280-58523-17), EAFB01-SB-002-003 (280-58523-18), EAFB04-SB-001-004 (280-58523-19), EAFB04-SB-001-001 (280-58523-20), EAFB04-SB-003-002 (280-58523-21), EAFB04-SB-002-001 (280-58523-22), EAFB04-SB-002-008 (280-58523-23), EAFB04-SB-004-005 (280-58523-24) and EAFB03-SD-001-001 (280-58523-25) were analyzed for PFC in accordance with SOP DV-LC-0012. The samples were prepared on 08/07/2014 and analyzed on 08/14/2014 and 08/15/2014.

Samples EAFB03-SB-004-010 (280-58523-2), EAFB02-SB-001-001 (280-58523-5), EAFB01-SB-002-001 (280-58523-17), EAFB03-SD-001-001 (280-58523-25), EAFB03-SD-001-001 (280-58523-25 MS) and EAFB03-SD-001-001 (280-58523-25 MSD) could not be thoroughly homogenized before sub-sampling was performed due to sample matrix.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to analytes present above the calibration range, two samples had to be analyzed at dilutions as outlined below.

EAFB03-SB-001-001 (280-58523-1) 40X for Run Type DL
EAFB03-SB-004-010 (280-58523-2) 20X for Run Type DL

Internal standards (IS) were not fortified, therefore, the IS percent recoveries need to be multiplied by 20 or 40 and the MDLs/RLs were not updated due to limitations in the software. Internal standards and surrogate recoveries in the diluted analyses may have recovered outside the control limits as a result of the dilutions.

The MS/MSD associated with prep batch 280-237985 was performed on sample EAFB01-SB-001-002 (280-58523-14). The MS/MSD exhibited spike compound recoveries and RPD data outside the control limits for PFTeA and PFTriA. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample have been flagged “J” in accordance with the DoD QSM.

Internal standard responses were outside the control limits for samples EAFB03-SB-001-001 (280-58523-1) and EAFB03-SB-004-010 (280-58523-2). The samples show evidence of matrix interference. The internal standards were in control for the Method Blank and LCS, indicating that the sample matrix may be causing the internal standard outages.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Percent Solids

Samples EAFB03-SB-001-001 (280-58523-1), EAFB03-SB-004-010 (280-58523-2), EAFB03-SB-003-009 (280-58523-3), EAFB03-SB-002-010 (280-58523-4), EAFB02-SB-001-001 (280-58523-5), EAFB02-SB-001-008 (280-58523-6), EAFB02-SB-002-001 (280-58523-7), EAFB02-SB-002-005 (280-58523-8), EAFB02-SB-003-003 (280-58523-9), EAFB01-SB-003-001 (280-58523-10), EAFB01-SB-003-006 (280-58523-11), EAFB01-SB-001-001 (280-58523-12), EAFB01-SB-001-901 (280-58523-13), EAFB01-SB-001-002 (280-58523-14), EAFB01-SB-001-902 (280-58523-15), EAFB03-SB-001-010 (280-58523-16), EAFB01-SB-002-001 (280-58523-17), EAFB01-SB-002-003 (280-58523-18), EAFB04-SB-001-004 (280-58523-19), EAFB04-SB-001-001 (280-58523-20), EAFB04-SB-003-002 (280-58523-21), EAFB04-SB-002-001 (280-58523-22), EAFB04-SB-002-008 (280-58523-23), EAFB04-SB-004-005 (280-58523-24) and EAFB03-SD-001-001 (280-58523-25) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 08/04/2014.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

SAMPLE SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-58523-1	EAFB03-SB-001-001	Solid	07/29/2014 0930	08/04/2014 0955
280-58523-2	EAFB03-SB-004-010	Solid	07/28/2014 1152	08/04/2014 0955
280-58523-3	EAFB03-SB-003-009	Solid	07/28/2014 1219	08/04/2014 0955
280-58523-4	EAFB03-SB-002-010	Solid	07/28/2014 1242	08/04/2014 0955
280-58523-5	EAFB02-SB-001-001	Solid	07/28/2014 1410	08/04/2014 0955
280-58523-6	EAFB02-SB-001-008	Solid	07/28/2014 1420	08/04/2014 0955
280-58523-7	EAFB02-SB-002-001	Solid	07/29/2014 1115	08/04/2014 0955
280-58523-8	EAFB02-SB-002-005	Solid	07/29/2014 1120	08/04/2014 0955
280-58523-9	EAFB02-SB-003-003	Solid	07/29/2014 1215	08/04/2014 0955
280-58523-10	EAFB01-SB-003-001	Solid	07/29/2014 1340	08/04/2014 0955
280-58523-11	EAFB01-SB-003-006	Solid	07/29/2014 1345	08/04/2014 0955
280-58523-12	EAFB01-SB-001-001	Solid	07/29/2014 1420	08/04/2014 0955
280-58523-12MS	EAFB01-SB-001-001	Solid	07/29/2014 1420	08/04/2014 0955
280-58523-12MSD	EAFB01-SB-001-001	Solid	07/29/2014 1420	08/04/2014 0955
280-58523-13	EAFB01-SB-001-901	Solid	07/29/2014 1422	08/04/2014 0955
280-58523-14	EAFB01-SB-001-002	Solid	07/29/2014 1425	08/04/2014 0955
280-58523-14MS	EAFB01-SB-001-002	Solid	07/29/2014 1425	08/04/2014 0955
280-58523-14MSD	EAFB01-SB-001-002	Solid	07/29/2014 1425	08/04/2014 0955
280-58523-15	EAFB01-SB-001-902	Solid	07/29/2014 1430	08/04/2014 0955
280-58523-16	EAFB03-SB-001-010	Solid	07/29/2014 0920	08/04/2014 0955
280-58523-17	EAFB01-SB-002-001	Solid	07/29/2014 1525	08/04/2014 0955
280-58523-18	EAFB01-SB-002-003	Solid	07/29/2014 1530	08/04/2014 0955
280-58523-19	EAFB04-SB-001-004	Solid	07/29/2014 1730	08/04/2014 0955
280-58523-20	EAFB04-SB-001-001	Solid	07/29/2014 1805	08/04/2014 0955
280-58523-21	EAFB04-SB-003-002	Solid	07/29/2014 1650	08/04/2014 0955
280-58523-22	EAFB04-SB-002-001	Solid	07/30/2014 1245	08/04/2014 0955
280-58523-23	EAFB04-SB-002-008	Solid	07/30/2014 1250	08/04/2014 0955
280-58523-24	EAFB04-SB-004-005	Solid	07/30/2014 1345	08/04/2014 0955
280-58523-25	EAFB03-SD-001-001	Solid	07/30/2014 1520	08/04/2014 0955
280-58523-25MS	EAFB03-SD-001-001	Solid	07/30/2014 1520	08/04/2014 0955
280-58523-25MSD	EAFB03-SD-001-001	Solid	07/30/2014 1520	08/04/2014 0955

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-1	**EAFB03-SB-001-001**					
Perfluorobutane Sulfonate (PFBS)		0.71	J	0.93	ug/Kg	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		10	M	0.93	ug/Kg	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.59	J	0.93	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.72	J	0.93	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		11		0.93	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		2.2		0.93	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		23		0.93	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		3.2		0.93	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		5700		0.93	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		6.0		0.93	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.84	J	0.93	ug/Kg	DV-LC-0012
Percent Moisture		15		0.10	%	Moisture
Percent Solids		85		0.10	%	Moisture
280-58523-2	**EAFB03-SB-004-010**					
Perfluorobutane Sulfonate (PFBS)		72		0.94	ug/Kg	DV-LC-0012
Perfluorobutanoic acid (PFBA)		14		0.94	ug/Kg	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		18	M	0.94	ug/Kg	DV-LC-0012
Perfluorodecanoic acid (PFDA)		0.42	J	0.94	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		6.8		0.94	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		130		0.94	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		140		0.94	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		150		0.94	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		1400		0.94	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		130		0.94	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		50		0.94	ug/Kg	DV-LC-0012
Percent Moisture		16		0.10	%	Moisture
Percent Solids		84		0.10	%	Moisture
280-58523-3	**EAFB03-SB-003-009**					
Perfluorobutane Sulfonate (PFBS)		4.2		0.82	ug/Kg	DV-LC-0012
Perfluorobutanoic acid (PFBA)		0.96		0.82	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		1.4		0.82	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		41		0.82	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		30		0.82	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.76	J	0.82	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		49		0.82	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		2.8		0.82	ug/Kg	DV-LC-0012
Percent Moisture		3.9		0.10	%	Moisture
Percent Solids		96		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-4	**EAFB03-SB-002-010**					
Perfluorobutane Sulfonate (PFBS)		23		0.81	ug/Kg	DV-LC-0012
Perfluorobutanoic acid (PFBA)		7.8		0.81	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		4.0		0.81	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		31		0.81	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		53		0.81	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.20	J	0.81	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		13		0.81	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		16		0.81	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		18		0.81	ug/Kg	DV-LC-0012
Percent Moisture		6.3		0.10	%	Moisture
Percent Solids		94		0.10	%	Moisture
280-58523-5	**EAFB02-SB-001-001**					
Perfluorodecane sulfonate (PFDS)		0.75	J	0.85	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		0.43	J	0.85	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		4.9		0.85	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2.3		0.85	ug/Kg	DV-LC-0012
Percent Moisture		14		0.10	%	Moisture
Percent Solids		86		0.10	%	Moisture
280-58523-6	**EAFB02-SB-001-008**					
Perfluorohexane Sulfonate (PFHxS)		0.65	J	0.95	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.21	J	0.95	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.34	J	0.95	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		14		0.95	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.36	J	0.95	ug/Kg	DV-LC-0012
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture
280-58523-7	**EAFB02-SB-002-001**					
Perfluorohexane Sulfonate (PFHxS)		1.6		0.97	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		4.1		0.97	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		140		0.97	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		2.5		0.97	ug/Kg	DV-LC-0012
Percent Moisture		25		0.10	%	Moisture
Percent Solids		75		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-8	**EAFB02-SB-002-005**					
Perfluorohexane Sulfonate (PFHxS)		1.0		0.84	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		1.0		0.84	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		120	M	0.84	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		0.69	J	0.84	ug/Kg	DV-LC-0012
Percent Moisture		5.7		0.10	%	Moisture
Percent Solids		94		0.10	%	Moisture
280-58523-9	**EAFB02-SB-003-003**					
Perfluorobutanoic acid (PFBA)		1.1		0.96	ug/Kg	DV-LC-0012
Perfluorodecane sulfonate (PFDS)		0.45	J	0.96	ug/Kg	DV-LC-0012
Perfluorodecanoic acid (PFDA)		2.6		0.96	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		1.4		0.96	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.2		0.96	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		2.3		0.96	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		1.5		0.96	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		0.12	J M	0.96	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		30		0.96	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		5.7		0.96	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		3.0		0.96	ug/Kg	DV-LC-0012
Percent Moisture		23		0.10	%	Moisture
Percent Solids		77		0.10	%	Moisture
280-58523-10	**EAFB01-SB-003-001**					
Perfluorodecane sulfonate (PFDS)		0.61	J	0.92	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		0.14	J	0.92	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		8.4		0.92	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		0.30	J	0.92	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		1.3		0.92	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonamide (FOSA)		1.0		0.92	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		99		0.92	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		2.6		0.92	ug/Kg	DV-LC-0012
Percent Moisture		18		0.10	%	Moisture
Percent Solids		82		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-11	**EAFB01-SB-003-006**					
Perfluorobutane Sulfonate (PFBS)		0.86	J	1.1	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		66		1.1	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		1.4		1.1	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		0.38	J	1.1	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		1.0	J	1.1	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		0.65	J M	1.1	ug/Kg	DV-LC-0012
Percent Moisture		32		0.10	%	Moisture
Percent Solids		68		0.10	%	Moisture
280-58523-12	**EAFB01-SB-001-001**					
Perfluorooctane Sulfonate (PFOS)		0.80	J	1.1	ug/Kg	DV-LC-0012
Percent Moisture		33		0.10	%	Moisture
Percent Solids		67		0.10	%	Moisture
280-58523-13	**EAFB01-SB-001-901**					
Perfluorooctane Sulfonate (PFOS)		0.40	J	0.92	ug/Kg	DV-LC-0012
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture
280-58523-14	**EAFB01-SB-001-002**					
Percent Moisture		23		0.10	%	Moisture
Percent Solids		77		0.10	%	Moisture
280-58523-15	**EAFB01-SB-001-902**					
Percent Moisture		26		0.10	%	Moisture
Percent Solids		74		0.10	%	Moisture
280-58523-16	**EAFB03-SB-001-010**					
Perfluorobutane Sulfonate (PFBS)		17		0.81	ug/Kg	DV-LC-0012
Perfluorobutanoic acid (PFBA)		3.0		0.81	ug/Kg	DV-LC-0012
Perfluoroheptanoic acid (PFHpA)		1.9		0.81	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		66		0.81	ug/Kg	DV-LC-0012
Perfluorohexanoic acid (PFHxA)		29		0.81	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		14		0.81	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		140		0.81	ug/Kg	DV-LC-0012
Perfluoropentanoic acid (PFPA)		10		0.81	ug/Kg	DV-LC-0012
Percent Moisture		5.3		0.10	%	Moisture
Percent Solids		95		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-17	**EAFB01-SB-002-001**					
Perfluorooctane Sulfonate (PFOS)		3.7		1.0	ug/Kg	DV-LC-0012
Percent Moisture		25		0.10	%	Moisture
Percent Solids		75		0.10	%	Moisture
280-58523-18	**EAFB01-SB-002-003**					
Perfluorooctane Sulfonate (PFOS)		10		0.98	ug/Kg	DV-LC-0012
Percent Moisture		19		0.10	%	Moisture
Percent Solids		81		0.10	%	Moisture
280-58523-19	**EAFB04-SB-001-004**					
Percent Moisture		14		0.10	%	Moisture
Percent Solids		86		0.10	%	Moisture
280-58523-20	**EAFB04-SB-001-001**					
Perfluorooctane Sulfonate (PFOS)		0.78	J	0.86	ug/Kg	DV-LC-0012
Percent Moisture		13		0.10	%	Moisture
Percent Solids		87		0.10	%	Moisture
280-58523-21	**EAFB04-SB-003-002**					
Perfluorohexane Sulfonate (PFHxS)		0.37	J	1.0	ug/Kg	DV-LC-0012
Percent Moisture		23		0.10	%	Moisture
Percent Solids		77		0.10	%	Moisture
280-58523-22	**EAFB04-SB-002-001**					
Perfluorohexane Sulfonate (PFHxS)		1.9		0.82	ug/Kg	DV-LC-0012
Perfluorononanoic acid (PFNA)		1.5		0.82	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		15		0.82	ug/Kg	DV-LC-0012
Perfluorooctanoic acid (PFOA)		2.8		0.82	ug/Kg	DV-LC-0012
Percent Moisture		9.1		0.10	%	Moisture
Percent Solids		91		0.10	%	Moisture
280-58523-23	**EAFB04-SB-002-008**					
Perfluoroheptanoic acid (PFHpA)		0.43	J	0.93	ug/Kg	DV-LC-0012
Perfluorohexane Sulfonate (PFHxS)		1.7		0.93	ug/Kg	DV-LC-0012
Percent Moisture		15		0.10	%	Moisture
Percent Solids		85		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58523-24	**EAFB04-SB-004-005**					
Perfluorononanoic acid (PFNA)		0.50	J	0.81	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		3.3		0.81	ug/Kg	DV-LC-0012
Percent Moisture		4.5		0.10	%	Moisture
Percent Solids		96		0.10	%	Moisture
280-58523-25	**EAFB03-SD-001-001**					
Perfluorohexane Sulfonate (PFHxS)		0.36	J	0.93	ug/Kg	DV-LC-0012
Perfluorooctane Sulfonate (PFOS)		2.7		0.93	ug/Kg	DV-LC-0012
Percent Moisture		18		0.10	%	Moisture
Percent Solids		82		0.10	%	Moisture

DATA REPORTING QUALIFIERS

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Lab Section	Qualifier	Description
LCMS		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
	M	Manual integrated compound.
	D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
	U	Undetected at the Limit of Detection.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

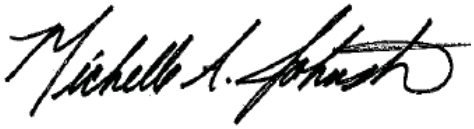
Job Number: 280-58508-1

SDG Number: Eielson

Job Description: Air Force Multi - Base PFC Investigation

For:
SES Construction & Fuel Services, LLC
1006 Floyd Culler Court
Oak Ridge, TN 37830

Attention: Doug Hawn



Approved for release.
Michelle A Johnston
Project Manager II
8/28/2014 7:25 AM

Michelle A Johnston, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0110
michelle.johnston@testamericainc.com
08/28/2014

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is E87667.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

CASE NARRATIVE
Client: SES Construction and Fuel Services LLC
Project: Air Force Multi - Base PFC Investigation - Eielson
Report Number: 280-58508-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Sample Receipt

The following report contains the analytical results for two samples received August 4, 2014, according to documented sample acceptance procedures. The samples were received at a temperature of 19.1°C.

The samples presented in this report were received at the laboratory intact, but at an elevated temperature of 19.1°C. The client was notified on August 4, 2014, and instructed the laboratory to proceed with all requested analyses.

No other anomalies were encountered during sample receipt.

TCLP Volatiles

Samples EAFB-IDW-01 (280-58508-1) and EAFB-IDW-02 (280-58508-2) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311/8260B. The samples were leached on 08/05/2014 and 08/06/2014 and analyzed on 08/09/2014 and 08/13/2014.

Chloroform was detected in method blank LB 280-237576/1-A at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged “J” in accordance with the DoD QSM.

Due to an analyst oversight, LB 280-237576/1-A was spiked twice with surrogate. The spiking amount was adjusted to reflect the actual amount spiked.

MS/MSD analyses for analytical batches 280-238183 and 280-238582 were not requested.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TCLP Semivolatiles

Sample EAFB-IDW-01 (280-58508-1) was analyzed for 8270 in accordance with SW-846 1311/8270. The sample was leached on 08/05/2014, prepared on 08/08/2014 and analyzed on 08/12/2014.

Sample EAFB-IDW-02 (280-58508-2) was analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with 8270D. The sample was leached on 08/05/2014, prepared on 08/08/2014 and analyzed on 08/12/2014.

The MS/MSD associated with prep batch 280-238121 was performed on sample EAFB-IDW-01 (280-58508-1). The MS/MSD exhibited RPD data outside the QC control limits for Pyridine. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged “J” in accordance with the DoD QSM.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TCLP Organochlorine Pesticides

Samples EAFB-IDW-01 (280-58508-1) and EAFB-IDW-02 (280-58508-2) were analyzed for TCLP pesticides in accordance with EPA SW-846 Method 8081B. The samples were leached on 08/05/2014, prepared on 08/08/2014 and analyzed on 08/11/2014.

TestAmerica Denver’s practice for the reporting of dual column data in packages requiring forms and/or raw data is to report the surrogates from both columns, and the preferred result for any given target analyte from the analyst selected column. The preferred results for target analytes and surrogates are reported as PRIMARY on the Sample Datasheets.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TCLP Herbicides

Samples EAFB-IDW-01 (280-58508-1) and EAFB-IDW-02 (280-58508-2) were analyzed for TCLP chlorinated herbicides in accordance

with EPA SW-846 Methods 1311/ 8151A. The samples were leached on 08/05/2014, prepared on 08/06/2014 and 08/07/2014 and analyzed on 08/11/2014.

TestAmerica Denver's practice for the reporting of dual column data in packages requiring forms and/or raw data is to report the surrogates from both columns, and the preferred result for any given target analyte from the analyst selected column. The preferred results for target analytes and surrogates are reported as PRIMARY on the Sample Datasheets. Analytes 2,4-DB/dinoseb co-elute on one of the columns used for this analysis. As a result, there are no results reported for the %Difference in the concentration on the Form X.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TCLP Metals ICP

Samples EAFB-IDW-01 (280-58508-1) and EAFB-IDW-02 (280-58508-2) were analyzed for TCLP metals in accordance with EPA SW-846 Methods 1311/ 6010B. The samples were leached on 08/05/2014, prepared on 08/06/2014 and 08/11/2014 and analyzed on 08/12/2014 and 08/13/2014.

Barium and Silver were detected in method blank LB3 280-237577/1-B at levels that were less than one half the reporting limits; therefore, corrective action was deemed unnecessary. The values should be considered estimates, and have been flagged "J" in accordance with the DoD QSM.

Barium was detected in method blank LB 280-237523/1-B at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged "J" in accordance with the DoD QSM.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TCLP Mercury

Samples EAFB-IDW-01 (280-58508-1) and EAFB-IDW-02 (280-58508-2) were analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 08/05/2014, prepared on 08/11/2014 and analyzed on 08/12/2014.

The LCS associated with prep batches 280-238268 and 280-238271 exhibited percent recoveries above the QC control limits for Mercury. As no detectable concentrations are present in the associated samples, corrective action is deemed unnecessary. The associated data have been flagged "Q" in accordance with the DoD QSM.

The MS/MSD associated with prep batch 280-238268 was performed on sample EAFB-IDW-01 (280-58508-1). The MS/MSD exhibited spike compound recoveries outside the QC control limits for Mercury. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged "J" in accordance with the DoD QSM.

The MS/MSD associated with prep batch 280-238271 was performed on sample EAFB-IDW-02 (280-58508-2). The MS/MSD exhibited spike compound recoveries outside the QC control limits for Mercury. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged "J" in accordance with the DoD QSM.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Ignitability/Flashpoint

Sample EAFB-IDW-01 (280-58508-1) was analyzed for ignitability in accordance with EPA SW-846 Method 1010. The sample was analyzed on 08/19/2014.

Sample EAFB-IDW-02 (280-58508-2) was analyzed for Ignitability in accordance with EPA SW-846 Method 7.1.2. The sample was analyzed on 08/07/2014.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Total Cyanide

Sample EAFB-IDW-01 (280-58508-1) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The sample was prepared and analyzed on 08/11/2014.

Sample EAFB-IDW-02 (280-58508-2) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The sample was prepared and analyzed on 08/13/2014.

Cyanide, Total was detected in method blank MB 280-238263/5-A at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged "J" in accordance with the DoD QSM.

Cyanide, Total was detected in method blank MB 280-238623/5-A at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged "J" in accordance with the DoD QSM.

MS/MSD analyses for prep batches 280-238263 and 280-238623 were not requested.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sulfide
Sample EAFB-IDW-01 (280-58508-1) was analyzed for sulfide in accordance with EPA SW-846 Method 9034. The sample was prepared and analyzed on 08/05/2014.

Sample EAFB-IDW-02 (280-58508-2) was analyzed for total sulfide in accordance with EPA SW-846 Method 9034. The sample was prepared and analyzed on 08/05/2014.

Sulfide was detected in method blank MB 280-237397/3-A at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged “J” in accordance with the DoD QSM.

The MS/MSD associated with prep batch 280-237397 was performed on sample EAFB-IDW-02 (280-58508-2). The MS/MSD exhibited spike compound recoveries and RPD data outside the QC control limits for Sulfide. The acceptable LCS/LCSD analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged “J” in accordance with the DoD QSM.

MS/MSD analyses for prep batch 280-237499 were not requested.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

pH
Sample EAFB-IDW-01 (280-58508-1) was analyzed for pH in accordance with EPA SW-846 9040C. The sample was analyzed on 08/04/2014.

Sample EAFB-IDW-02 (280-58508-2) was analyzed for pH (corrosivity) in accordance with EPA SW-846 Method 9045D. The sample was leached on 08/11/2014 and analyzed on 08/11/2014.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Percent Solids
Sample EAFB-IDW-02 (280-58508-2) was analyzed for percent solids in accordance with ASTM D2216-90. The sample was analyzed on 08/04/2014.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

SAMPLE SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-58508-1	EAFB-IDW-01	Water	07/30/2014 1350	08/04/2014 0955
280-58508-2	EAFB-IDW-02	Solid	07/30/2014 1400	08/04/2014 0955

EXECUTIVE SUMMARY - Detections

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-58508-1	**EAFB-IDW-01**					
Flashpoint		>160		1.00	Degrees F	1010A
Cyanide, Total		0.0029	J	0.010	mg/L	9012B
pH adj. to 25 deg C		8.05	HF	0.100	SU	9040C
TCLP						
2,4-D		0.0028	J	0.040	mg/L	8151A
Arsenic		0.025	J	0.50	mg/L	6010B
Barium		0.57	J	1.0	mg/L	6010B
Chromium		0.0043	J	0.50	mg/L	6010B
Silver		0.011	J	0.50	mg/L	6010B
280-58508-2	**EAFB-IDW-02**					
Ignitability		NO			No Unit	7.1.2
Cyanide, Total		0.21	J	0.54	mg/Kg	9012B
Sulfide		7.1	J	5.5	mg/Kg	9034
Percent Moisture		9.3		0.10	%	Moisture
Percent Solids		91		0.10	%	Moisture
TCLP						
Chloroform		2.9	J	10	ug/L	8260B
2,4-D		0.0030	J	0.040	mg/L	8151A
Barium		0.57	J	1.0	mg/L	6010B
Cadmium		0.0042	J	0.10	mg/L	6010B
Chromium		0.0046	J	0.50	mg/L	6010B
Soluble						
pH adj. to 25 deg C-Soluble		8.39		0.100	SU	9045D

METHOD SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds (GC/MS)	TAL DEN	SW846 8260B	
TCLP Extraction	TAL DEN		SW846 1311
Purge and Trap	TAL DEN		SW846 5030B
Semivolatile Organic Compounds (GC/MS)	TAL DEN	SW846 8270D	
TCLP Extraction	TAL DEN		SW846 1311
Liquid-Liquid Extraction (Separatory Funnel)	TAL DEN		SW846 3510C
Organochlorine Pesticides (GC)	TAL DEN	SW846 8081B	
TCLP Extraction	TAL DEN		SW846 1311
Liquid-Liquid Extraction (Separatory Funnel)	TAL DEN		SW846 3510C
Herbicides (GC)	TAL DEN	SW846 8151A	
TCLP Extraction	TAL DEN		SW846 1311
Extraction (Herbicides)	TAL DEN		SW846 8151A
Metals (ICP)	TAL DEN	SW846 6010B	
TCLP Extraction	TAL DEN		SW846 1311
Preparation, Total Metals	TAL DEN		SW846 3010A
Mercury (CVAA)	TAL DEN	SW846 7470A	
TCLP Extraction	TAL DEN		SW846 1311
Preparation, Mercury	TAL DEN		SW846 7470A
Ignitablity,Solids	TAL DEN	SW846 7.1.2	
Cyanide, Total andor Amenable	TAL DEN	SW846 9012B	
Cyanide, Total and/or Amenable, Distillation	TAL DEN		SW846 9012B
Sulfide, Acid Soluble and Insoluble (Titrimetric)	TAL DEN	SW846 9034	
Sulfide, Distillation (Acid Soluble and Insoluble)	TAL DEN		SW846 9030B
pH	TAL DEN	SW846 9045D	
Deionized Water Leaching Procedure	TAL DEN		ASTM DI Leach
Percent Moisture	TAL DEN	EPA Moisture	
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL DEN	SW846 8260B	
TCLP Extraction	TAL DEN		SW846 1311
Purge and Trap	TAL DEN		SW846 5030B
Semivolatile Organic Compounds (GC/MS)	TAL DEN	SW846 8270C	
TCLP Extraction	TAL DEN		SW846 1311
Liquid-Liquid Extraction (Separatory Funnel)	TAL DEN		SW846 3510C
Organochlorine Pesticides (GC)	TAL DEN	SW846 8081B	
TCLP Extraction	TAL DEN		SW846 1311
Liquid-Liquid Extraction (Separatory Funnel)	TAL DEN		SW846 3510C
Herbicides (GC)	TAL DEN	SW846 8151A	
TCLP Extraction	TAL DEN		SW846 1311
Extraction (Herbicides)	TAL DEN		SW846 8151A
Metals (ICP)	TAL DEN	SW846 6010B	
TCLP Extraction	TAL DEN		SW846 1311
Preparation, Total Metals	TAL DEN		SW846 3010A

METHOD SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Mercury (CVAA)	TAL DEN	SW846 7470A	
TCLP Extraction	TAL DEN		SW846 1311
Preparation, Mercury	TAL DEN		SW846 7470A
Ignitability, Pensky-Martens Closed Cup Method	TAL DEN	SW846 1010A	
Cyanide, Total andor Amenable	TAL DEN	SW846 9012B	
Cyanide, Total and/or Amenable, Distillation	TAL DEN		SW846 9012B
Sulfide, Acid Soluble and Insoluble (Titrimetric)	TAL DEN	SW846 9034	
Sulfide, Distillation (Acid Soluble and Insoluble)	TAL DEN		SW846 9030B
pH	TAL DEN	SW846 9040C	

Lab References:

TAL DEN = TestAmerica Denver

Method References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Method	Analyst	Analyst ID
SW846 8260B	Contreras, Evan	EC
SW846 8260B	Lines, Jeremy N	JNL
SW846 8270C	Hoffman, Michael G	MGH
SW846 8270D	Kiekel, Daniel C	DCK
SW846 8081B	Wells, David A	DAW
SW846 8151A	Wells, David A	DAW
SW846 6010B	Broander, Laura L	LLB
SW846 6010B	Trudell, Lynn-Anne M	LMT
SW846 7470A	Grisdale, Christopher G	CGG
SW846 7470A	Whyte, Whitney A	WAW
SW846 1010A	Allen, Andrew J	AJA
SW846 7.1.2	Woolley, Mark -	MW1
SW846 9012B	Newcome, Robin S	RSN
SW846 9034	Lawrence, Caitlyn M	CML
SW846 9040C	Bland, Morgan R	MRB
SW846 9045D	Bland, Morgan R	MRB
EPA Moisture	Schultz, Cassandra M	CMS

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

8260B Volatile Organic Compounds (GC/MS)-TCLP

Analysis Method:	8260B	Analysis Batch:	280-238582	Instrument ID:	VMS_G
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	G7499.D
Dilution:	1.0	Leach Batch:	280-237767	Initial Weight/Volume:	2 mL
Analysis Date:	08/13/2014 0204			Final Weight/Volume:	20 mL
Prep Date:	08/13/2014 0204				
Leach Date:	08/06/2014 1600				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
1,1-Dichloroethene	0.0040	U	0.0023	0.010
1,2-Dichloroethane	0.0040	U	0.0013	0.010
2-Butanone (MEK)	0.032	U	0.018	0.10
Benzene	0.0020	U	0.0016	0.010
Carbon tetrachloride	0.0040	U	0.0019	0.010
Chlorobenzene	0.0020	U	0.0017	0.010
Chloroform	0.0020	U	0.0016	0.010
Tetrachloroethene	0.0040	U	0.0020	0.010
Trichloroethene	0.0020	U	0.0016	0.010
Vinyl chloride	0.0080	U	0.0010	0.010

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90		64 - 129
4-Bromofluorobenzene (Surr)	103		78 - 121
Dibromofluoromethane (Surr)	93		79 - 119
Toluene-d8 (Surr)	103		78 - 120

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

8260B Volatile Organic Compounds (GC/MS)-TCLP

Analysis Method:	8260B	Analysis Batch:	280-238183	Instrument ID:	VMS_C
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	C587.D
Dilution:	1.0	Leach Batch:	280-237576	Initial Weight/Volume:	2 mL
Analysis Date:	08/09/2014 0225			Final Weight/Volume:	20 mL
Prep Date:	08/09/2014 0225				
Leach Date:	08/05/2014 1620				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	DL	LOQ
1,1-Dichloroethene		4.0	U	2.3	10
1,2-Dichloroethane		4.0	U	1.3	10
2-Butanone (MEK)		32	U	18	100
Benzene		2.0	U	1.6	10
Carbon tetrachloride		4.0	U	1.9	10
Chlorobenzene		2.0	U	1.7	10
Chloroform		2.9	J	1.6	10
Tetrachloroethene		4.0	U	2.0	10
Trichloroethene		2.0	U	1.6	10
Vinyl chloride		8.0	U	1.0	10

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100		64 - 129
4-Bromofluorobenzene (Surr)	78		78 - 121
Dibromofluoromethane (Surr)	94		79 - 119
Toluene-d8 (Surr)	82		78 - 120

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

8270C Semivolatile Organic Compounds (GC/MS)-TCLP

Analysis Method:	8270C	Analysis Batch:	280-238530	Instrument ID:	SMS_Y
Prep Method:	3510C	Prep Batch:	280-238121	Lab File ID:	Y0624.D
Dilution:	1.0	Leach Batch:	280-237577	Initial Weight/Volume:	200 mL
Analysis Date:	08/12/2014 1730			Final Weight/Volume:	1 mL
Prep Date:	08/08/2014 1420			Injection Volume:	0.5 uL
Leach Date:	08/05/2014 1730				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
Pyridine	0.010	U J	0.0057	0.10
1,4-Dichlorobenzene	0.0050	U	0.0016	0.020
2-Methylphenol	0.020	U	0.0049	0.050
3 & 4 Methylphenol	0.0050	U	0.0013	0.050
Hexachloroethane	0.020	U	0.011	0.050
Nitrobenzene	0.010	U	0.0041	0.050
Hexachlorobutadiene	0.050	U	0.017	0.050
2,4,6-Trichlorophenol	0.0050	U	0.0014	0.025
2,4,5-Trichlorophenol	0.0050	U	0.0022	0.050
2,4-Dinitrotoluene	0.020	U	0.0083	0.050
Hexachlorobenzene	0.0050	U	0.0033	0.050
Pentachlorophenol	0.20	U	0.10	0.25
Total Cresols	0.020	U	0.0013	0.050

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	67		50 - 120
Phenol-d5	61		47 - 120
Nitrobenzene-d5	72		51 - 120
2-Fluorobiphenyl	71		49 - 120
2,4,6-Tribromophenol	87		51 - 120
Terphenyl-d14	93		56 - 120

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

8270D Semivolatile Organic Compounds (GC/MS)-TCLP

Analysis Method:	8270D	Analysis Batch:	280-238512	Instrument ID:	SMS_K
Prep Method:	3510C	Prep Batch:	280-238119	Lab File ID:	K8010.D
Dilution:	1.0	Leach Batch:	280-237523	Initial Weight/Volume:	200 mL
Analysis Date:	08/12/2014 1512			Final Weight/Volume:	1 mL
Prep Date:	08/08/2014 1420			Injection Volume:	0.5 uL
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
2,4,5-Trichlorophenol		0.0050	U	0.0022	0.050
2,4,6-Trichlorophenol		0.0050	U	0.0014	0.025
2,4-Dinitrotoluene		0.020	U	0.0083	0.050
2-Methylphenol		0.020	U	0.0049	0.050
3 & 4 Methylphenol		0.0050	U	0.0013	0.050
Hexachlorobenzene		0.0050	U	0.0033	0.050
Hexachlorobutadiene		0.050	U	0.017	0.050
Hexachloroethane		0.020	U	0.011	0.050
Pentachlorophenol		0.20	U	0.10	0.25
Pyridine		0.010	U	0.0057	0.10
1,4-Dichlorobenzene		0.0050	U	0.0016	0.020
Nitrobenzene		0.010	U	0.0041	0.050

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	72		49 - 120
2-Fluorophenol (Surr)	66		50 - 120
2,4,6-Tribromophenol (Surr)	77		51 - 120
Nitrobenzene-d5 (Surr)	71		51 - 120
Phenol-d5 (Surr)	58		47 - 120
Terphenyl-d14 (Surr)	82		56 - 120

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

8081B Organochlorine Pesticides (GC)-TCLP

Analysis Method:	8081B	Analysis Batch:	280-238235	Instrument ID:	SGC_P1
Prep Method:	3510C	Prep Batch:	280-238123	Initial Weight/Volume:	100 mL
Dilution:	1.0	Leach Batch:	280-237577	Final Weight/Volume:	10 mL
Analysis Date:	08/11/2014 1502			Injection Volume:	1 uL
Prep Date:	08/08/2014 1425			Result Type:	PRIMARY
Leach Date:	08/05/2014 1730				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
Endrin	0.00010	U	0.000079	0.00050
gamma-BHC (Lindane)	0.00010	U	0.000069	0.00050
Heptachlor	0.00010	U	0.000077	0.00050
Heptachlor epoxide	0.00010	U	0.000075	0.00050
Methoxychlor	0.00020	U	0.00013	0.0010
Technical Chlordane	0.0048	U	0.0014	0.0050
Toxaphene	0.0080	U	0.0037	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	79		34 - 122
Tetrachloro-m-xylene	96		28 - 115

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

8081B Organochlorine Pesticides (GC)-TCLP

Analysis Method:	8081B	Analysis Batch:	280-238235	Instrument ID:	SGC_P1
Prep Method:	3510C	Prep Batch:	280-238153	Initial Weight/Volume:	100 mL
Dilution:	1.0	Leach Batch:	280-237523	Final Weight/Volume:	10 mL
Analysis Date:	08/11/2014 1722			Injection Volume:	1 uL
Prep Date:	08/08/2014 1813			Result Type:	PRIMARY
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
Endrin		0.00010	U	0.000079	0.00050
gamma-BHC (Lindane)		0.00010	U	0.000069	0.00050
Heptachlor		0.00010	U	0.000077	0.00050
Heptachlor epoxide		0.00010	U	0.000075	0.00050
Methoxychlor		0.00020	U	0.00013	0.0010
Technical Chlordane		0.0048	U	0.0014	0.0050
Toxaphene		0.0080	U	0.0037	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	101		34 - 122
Tetrachloro-m-xylene	95		28 - 115

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	280-238230	Instrument ID:	SGC_M
Prep Method:	8151A	Prep Batch:	280-237684	Initial Weight/Volume:	100 mL
Dilution:	1.0	Leach Batch:	280-237577	Final Weight/Volume:	10 mL
Analysis Date:	08/11/2014 1446			Injection Volume:	1 uL
Prep Date:	08/06/2014 1013			Result Type:	PRIMARY
Leach Date:	08/05/2014 1730				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
2,4-D	0.0028	J	0.0021	0.040
Silvex (2,4,5-TP)	0.0028	U	0.0017	0.010

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	84		10 - 131

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	280-238230	Instrument ID:	SGC_M
Prep Method:	8151A	Prep Batch:	280-237894	Initial Weight/Volume:	100 mL
Dilution:	1.0	Leach Batch:	280-237523	Final Weight/Volume:	10 mL
Analysis Date:	08/11/2014 1252			Injection Volume:	1 uL
Prep Date:	08/07/2014 1055			Result Type:	PRIMARY
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
2,4-D		0.0030	J	0.0021	0.040
Silvex (2,4,5-TP)		0.0028	U	0.0017	0.010

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	52		10 - 131

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

6010B Metals (ICP)-TCLP

Analysis Method:	6010B	Analysis Batch:	280-238608	Instrument ID:	MT_025
Prep Method:	3010A	Prep Batch:	280-237655	Lab File ID:	25C081214.asc
Dilution:	1.0	Leach Batch:	280-237577	Initial Weight/Volume:	10 mL
Analysis Date:	08/12/2014 2307			Final Weight/Volume:	50 mL
Prep Date:	08/06/2014 1450				
Leach Date:	08/05/2014 1730				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
Arsenic	0.025	J	0.022	0.50
Barium	0.57	J	0.0020	1.0
Cadmium	0.0070	U	0.0020	0.10
Chromium	0.0043	J	0.0030	0.50
Lead	0.035	U	0.013	0.50
Selenium	0.075	U	0.024	0.10
Silver	0.011	J	0.0040	0.50

7470A Mercury (CVAA)-TCLP

Analysis Method:	7470A	Analysis Batch:	280-238881	Instrument ID:	MT_034
Prep Method:	7470A	Prep Batch:	280-238268	Lab File ID:	140812taa.txt
Dilution:	1.0	Leach Batch:	280-237577	Initial Weight/Volume:	30 mL
Analysis Date:	08/12/2014 2318			Final Weight/Volume:	30 mL
Prep Date:	08/11/2014 1700				
Leach Date:	08/05/2014 1730				

Analyte	Result (mg/L)	Qualifier	DL	LOQ
Mercury	0.000080	U J Q	0.000030	0.0020

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

6010B Metals (ICP)-TCLP

Analysis Method:	6010B	Analysis Batch:	280-238454	Instrument ID:	MT_025
Prep Method:	3010A	Prep Batch:	280-237788	Lab File ID:	25c081114.asc
Dilution:	1.0	Leach Batch:	280-237523	Initial Weight/Volume:	10 mL
Analysis Date:	08/12/2014 0026			Final Weight/Volume:	50 mL
Prep Date:	08/11/2014 1030				
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
Arsenic		0.065	U	0.022	0.50
Barium		0.57	J	0.0020	1.0
Cadmium		0.0042	J	0.0020	0.10
Chromium		0.0046	J	0.0030	0.50
Lead		0.035	U	0.013	0.50
Silver		0.015	U	0.0040	0.50

Analysis Method:	6010B	Analysis Batch:	280-238840	Instrument ID:	MT_025
Prep Method:	3010A	Prep Batch:	280-237788	Lab File ID:	25B081314.asc
Dilution:	1.0	Leach Batch:	280-237523	Initial Weight/Volume:	10 mL
Analysis Date:	08/13/2014 1921			Final Weight/Volume:	50 mL
Prep Date:	08/11/2014 1030				
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
Selenium		0.075	U	0.024	0.10

7470A Mercury (CVAA)-TCLP

Analysis Method:	7470A	Analysis Batch:	280-238536	Instrument ID:	MT_034
Prep Method:	7470A	Prep Batch:	280-238271	Lab File ID:	140811bc.txt
Dilution:	1.0	Leach Batch:	280-237523	Initial Weight/Volume:	30 mL
Analysis Date:	08/12/2014 1125			Final Weight/Volume:	30 mL
Prep Date:	08/11/2014 1700				
Leach Date:	08/05/2014 1453				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	DL	LOQ
Mercury		0.000080	U J Q	0.000030	0.0020

General Chemistry

Client Sample ID: **EAFB-IDW-01**

Lab Sample ID: 280-58508-1
Client Matrix: Water

Date Sampled: 07/30/2014 1350
Date Received: 08/04/2014 0955

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Flashpoint	>160		Degrees F	1.00	1.00	1.0	1010A
Analysis Batch: 280-239661	Analysis Date: 08/19/2014 1235						
Cyanide, Total	0.0029	J	mg/L	0.0020	0.010	1.0	9012B
Analysis Batch: 280-238409	Analysis Date: 08/11/2014 1524						
Prep Batch: 280-238263	Prep Date: 08/11/2014 0930						
Sulfide	1.3	U	mg/L	0.79	4.0	1.0	9034
Analysis Batch: 280-237504	Analysis Date: 08/05/2014 1230						
Prep Batch: 280-237499	Prep Date: 08/05/2014 1156						
pH adj. to 25 deg C	8.05	HF	SU	0.100	0.100	1.0	9040C
Analysis Batch: 280-237353	Analysis Date: 08/04/2014 1731						

General Chemistry

Client Sample ID: **EAFB-IDW-02**

Lab Sample ID: 280-58508-2
Client Matrix: Solid

Date Sampled: 07/30/2014 1400
Date Received: 08/04/2014 0955

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Ignitability	NO		No Unit			1.0	7.1.2
Analysis Batch: 280-238012	Analysis Date: 08/07/2014 2233						DryWt Corrected: N
Cyanide, Total	0.21	J	mg/Kg	0.11	0.54	1.0	9012B
Analysis Batch: 280-238782	Analysis Date: 08/13/2014 1431						DryWt Corrected: Y
Prep Batch: 280-238623	Prep Date: 08/13/2014 0852						
Sulfide	7.1	J	mg/Kg	2.6	5.5	1.0	9034
Analysis Batch: 280-237489	Analysis Date: 08/05/2014 1108						DryWt Corrected: Y
Prep Batch: 280-237397	Prep Date: 08/05/2014 0743						
pH adj. to 25 deg C-Soluble	8.39		SU	0.100	0.100	1.0	9045D
Analysis Batch: 280-238418	Analysis Date: 08/11/2014 1828						DryWt Corrected: N
Percent Moisture	9.3		%	0.10	0.10	1.0	Moisture
Analysis Batch: 280-237370	Analysis Date: 08/04/2014 1933						DryWt Corrected: N
Percent Solids	91		%	0.10	0.10	1.0	Moisture
Analysis Batch: 280-237370	Analysis Date: 08/04/2014 1933						DryWt Corrected: N

DATA REPORTING QUALIFIERS

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58508-1
Sdg Number: Eielson

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	U	Undetected at the Limit of Detection.
GC/MS Semi VOA		
	J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
	U	Undetected at the Limit of Detection.
GC Semi VOA		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	M	Manual integrated compound.
	U	Undetected at the Limit of Detection.
Metals		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
	Q	One or more quality control criteria failed.
	D	The reported value is from a dilution.
	U	Undetected at the Limit of Detection.
General Chemistry		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
	HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
	U	Undetected at the Limit of Detection.

Validation Report

Air Force Multi - Base PFC Investigation

Eielson, Alaska

Prepared by DataChek

September 8, 2014

TABLE OF CONTENTS

List of Tables

ACRONYMS AND ABBREVIATIONS

%	Percent
%D	percent difference
BTEX	benzene, toluene, ethylbenzene, and xylenes
CB	calibration blank
CCAL	continuing calibration
CCV	continuing calibration verification
COC	chain of custody
DRO	diesel range organic
EPH	extractible petroleum hydrocarbons
ER	equipment rinsate
FD	field duplicate
GRO	gasoline range organic
ICAL	initial calibration
ICL	instrument calibration limit
IS	internal standard
J	estimated value
LCS	laboratory control sample
MB	method blank
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl tert butyl ether
PAH	polynuclear aromatic hydrocarbon
PARCC	precision, accuracy, representativeness, comparability, completeness
PFC	perfluorinated hydrocarbons
QC	quality control
R	Rejected
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
SVOC	Semivolatile organic compound
TB	trip blank
TCE	Trichloroethene
TOC	total organic carbon
TOH	total organic halides
U	not detected
UJ	not detected; associated value is an estimate
VOC	volatile organic compound

1. INTRODUCTION

The data validation of 24 soil, 1 sediment, 17 ground-water and 2 surface-water samples (44 samples-2 SDGs) analyzed for perfluorinated hydrocarbons (PFCs), collected from Eielson AFB, Fairbanks, Alaska was completed in September 2014. Level III data validation was performed on all samples. All the samples from the sample delivery groups have the following label: Stage_3_Validation_Manual (S3VM). TestAmerica Laboratories, Denver, CO produced all the analytical data

2. PROCEDURES

The sample data were validated following the logic identified in *The Contract Laboratory Program (CLP) Data Validation Functional Guidelines for Evaluating Organic Analyses (June, 2008).* The laboratory method specific criteria were also employed to validate the information. The data validation qualifiers (Table 5-1) applied by the reviewer were recorded in a column adjacent and to the right of the laboratory results. A data validation reason code was also added to each of the reviewer's qualifiers to provide the user with a means to identify which results were qualified and the reason for the qualifiers (Table 5-2). The data were labeled according to *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (January, 2009).*

3. SUMMARY OF DATA VALIDATION FINDINGS

Overall the data from the 44 samples were of acceptable quality, and all measurements met the measures required to satisfy the project quality control (QC) objectives (precision, accuracy, representativeness, comparability, and completeness) were met. Each of these measures and specific data qualifications are discussed below.

***Precision*:** Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate analysis. Precision was measured at 94.3%.

***Accuracy*:** Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS), and surrogate recoveries. The overall measure of accuracy for the samples was calculated by comparing the number of spike recoveries that exceeded the laboratory limits by the total number of LCS, MS and surrogate recoveries. For the samples accuracy was measured at 94.1%.

***Representativeness*:** The measures of representativeness – sample handling, analytical blank analysis, field blanks – were met. Designated analytical protocols were followed. Holding times were met for the soils and sediment, but not for most of the ground-water or surface water samples. In addition, the holding temperature for some of the water samples exceeded the QC criteria by 2X. Overall, no major problems were identified resulting from analytical failure.

***Comparability*:** The samples were analyzed using appropriate approved methods of analysis. All data results were reported correctly and in standard units

***Completeness*:** Completeness is the amount of valid data compared to the planned amount and is expressed as a percent of the usable data points divided by the total number of analytes for each parameter analyzed. Out of a total of 704 data points, no data points were rejected, resulting in a completeness of 100 percent.

Data validation summaries, which function as worksheets for the validation task, are included for each parameter in each data package. The following section highlights the key findings of the data validation for each analysis.

4. ANALYSIS-SPECIFIC DATA VALIDATION SUMMARIES

4.1 PERFLUORINATED HYDROCARBONS (PFC)

Twenty-four soil, 1 sediment, 17 ground-water and 2 surface-water samples (total of 44 samples), from Eielson AFB, were analyzed for an array of 16 PFC compounds. Overall, the data are of good quality and are usable as qualified.

Sample Condition. The water samples collected on 7/30 were stored at a temperature greater than 2X the required QC temperature (14.2 C). All results from these samples were qualified as "UJ/J". All other samples were received in acceptable condition no qualifiers were needed. The client instructed the laboratory on August 8, 2014, that all analyses for sample EAFB03-SD-001-901 (SDG 58523) were to be cancelled. The sample consisted of water and rocks. The sample was not analyzed.

Holding Times. The soil and sediment samples were received in acceptable condition and were analyzed within the QC holding time. The water samples collected on 07/28/2014 and 7/29/2014 were extracted outside the 7 day holding time. All sample results were qualified as "UJ/J".

Initial and Continuing Calibration. The ICAL and CCV analyses were within the QC limits for all three of the SDGs..

Blanks. There were no compounds present in any of the method or field blanks for the three SDGs. No qualifiers were needed.

Surrogates. The water samples EAFB02-GW-001-000, EAFB02-GW-MW32-000, EAFB02-GW-MW32-000DL, EAFB02-GW-MW32-000 and EAFB02-GW-003-000 DL had high PFOS surrogate recoveries and detects in these samples were qualified as "J". All soil and sediment samples had surrogate recoveries within the QC limits.

Matrix Spike/Matrix Spike Duplicates. The EAFB01-GW-20MW32-000 MS/MSD from SDG 58521 had low recoveries for Perfluorooctanoic acid and this compound was qualified as "J" in the parent sample. Three compounds, Perfluorododecanoic acid, Perfluorodecanoic acid and Perfluoroundecanoic acid, in the EAFB03-SW-001-001 MS/MSD analyses, were above the QC limit. Since all results were non-detects for these compounds in the sample, no qualifiers were needed. Four compounds in the MS/MSDs had high recoveries, but the sample concentration was >4x than the spike and no qualifiers were required.

The MS/MSD analyses from SDG 58523 were within the QC criteria, so no qualifiers were needed.

Laboratory Control Sample. The recoveries for the LCS were within the QC limits for both SDGs and no qualifiers were required.

Internal Standards. A l number of IS area count recoveries in the SDGs were below the QC criteria. The effected samples and compounds that were qualified are shown below:

A). SDG 58521:

Ground-water/surface water: The following IS area count recoveries were below the QC criteria

Samples	IS Low Recovery Area Count	Qualifiers
EFAB01-GW-53M04B-000	Perfluorobutanoic acid, Perfluoropentanoic acid, Perfluorobutane Sulfonate	UJ/J
EFAB03-GW-MW33A-000	Perfluorohexanoic acid, Perfluoroheptanoic acid, Perfluorohexane Sulfonate, Perfluorooctanoic acid, Perfluorooctane Sulfonate, Perfluorononanoic acid	UJ/J
EFAB03-GW-MW33B-000	Perfluorooctane Sulfonate, Perfluorononanoic acid	UJ/J
EAFB02-GW-001-000	Perfluorohexane Sulfonate, Perfluorooctane Sulfonate, Perfluorononanoic acid	UJ/J

EFAB01-GW-20MW32-900	Perfluorobutanoic acid, Perfluoropentanoic acid, Perfluorobutane Sulfonate, Perfluorohexanoic acid, Perfluoroheptanoic acid, Perfluorohexane Sulfonate, Perfluorodecanoic acid, Perfluorodecane Sulfonate	UJ/J
EAFB04-GW-003-000	Perfluorohexane Sulfonate, Perfluorodecanoic acid, Perfluorodecane Sulfonate, Perfluoroundecanoic acid, Perfluorododecanoic acid, Perfluorooctane Sulfonamide	UJ/J
EAFB04-GW-002-000	Perfluorohexanoic acid, Perfluoroheptanoic acid	UJ/J
EAFB02-GW-003-000	Perfluorooctanoic acid, Perfluorooctane Sulfonate, Perfluorononanoic acid, Perfluorodecanoic acid, Perfluorodecane Sulfonate	UJ/J
EAFB03-SW-001-001	Perfluorodecanoic acid, Perfluorodecane Sulfonate	UJ/J
EAFB03-SW-001-901	Perfluorodecanoic acid, Perfluorodecane Sulfonate, Perfluoroundecanoic acid	UJ/J
EAFB02-GW-MW32-000	Perfluorohexanoic acid, Perfluoroheptanoic acid, Perfluorohexane Sulfonate, Perfluorooctanoic acid, Perfluorooctane Sulfonate, Perfluorononanoic acid, Perfluorodecanoic acid, Perfluorodecane Sulfonate	UJ/J
EAFB02-GW-MW30-000	Perfluorohexane Sulfonate, Perfluorooctanoic acid, Perfluorooctane Sulfonate, Perfluorononanoic acid	UJ/J
GW and SW DLs	All ISs	UJ/J
All samples	Perfluorotridecanoic acid, Perfluorotetradecanoic acid	UJ/J

B).SDG 58523:

Soils/Sediment Samples.

Low area count recoveries for Perfluorooctanoic Sulfonate in sample EAFB03-SB-001-001, Perfluorononanoic acid in samples EAFB03-SB-001-001and EAFB03-SB-004-010 resulted in these compounds being qualified as “UJ/J”. All compounds were below the QC criteria in EAFB03-SB-001-001DL, EAFB03-SB-004-010DL and results were qualified as “J”.

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Field Duplicates. All field duplicate analyses for both SDGs were within the QC criteria and no qualifiers were required.

Quantification. The sample results were acceptable as qualified.

5. DATA QUALIFIER DEFINITIONS

5.1 DATA QUALIFIER DEFINITIONS

Table 5-1 Data Qualifier Definitions

Qualifier	Definition
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was analyzed for, but was not detected above the reported sample quantification limit or the reported analyte value was not detected above 5x or 10x the level reported in laboratory or field blanks.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

5.2 DATA VALIDATION REASON CODES

During the review process, a data validation reason code was added to each of the reviewer's qualifiers to allow the user to identify which results were qualified and the reason(s) for the qualifiers. Reason codes are listed and defined in Table 5-2.

Table 5-2 Data Validation Reason Codes

Reason Code	Definition
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria

05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantification
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantification
24	Reported result and/or lab qualifier revised to reflect validation findings

% = percent
%D = percent difference
BFB = bromofluorobenzene
CCB = continuing calibration blank
DFTPP = decafluorotriphenylphosphine
ER = equipment rinseate
FB = field blank
GFAA = graphite furnace atomic absorption
ICB = initial calibration blank
LCS = laboratory control sample
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
RPD = relative percent difference
RRF = relative response factor
RSD = relative standard deviation
TB = trip blank

6. REFERENCES

EPA (U.S. Environmental Protection Agency), June 2008. OWSER 9240.1-48 *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA-540-R-08-01).*

EPA (U.S. Environmental Protection Agency), January 2009. OSWER 9200-1-85. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. (EPA-540/R-08-005).*

SDG: 280-58521-1 Project: Eielson AFB

Method: PFC DV-LC 0012/FOSA Matrix/No. Samples: Ground-water-17, Surface-water-2

Validation Samples: See attached sheet

Data Validation Report Summary

		Status Code	Comments
1.	Sample Preservation, Handling, and Transport	X	
2.	Chain of Custody	A	
3.	Holding Times	X	
4.	GC/MS Tune/Inst Perf	A	
5.	Calibrations	A	
6.	Blanks	A	
7.	Blank Spike/LCS	A	
8.	Matrix Spike	X	
9.	Surrogates	X	
10.	Internal Standards	X	
11.	Compound Identification	A	
12.	System Performance	A	
13.	Field QC Samples	A	
14.	Overall Assessment	X	

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

10a. A large number of IS area count recoveries were below the QC criteria. The effected samples and compounds are shown in the internal standard attachment to the worksheet.

8a. The EAFB01-GW-20MW32-000 MS/MSD had low recoveries for PFOA and this compound was qualified as "J" in the parent sample. Three compounds, PFDoA, PFTeA and PFUnA, in the EAFB03-SW-001-001 MS/MSD analyses were above the QC limit, but all results were non-detects for these compounds in the sample. No quals were needed.. Four compounds in the sample MS/MSDs had high recoveries, but the sample concentration was >4x than the spike and no qualifiers were required.

7a. The following had high PFOS surrogate recoveries and detects in these samples were qualified as "J": EAFB02-GW-001-000, EAFB02-GW-MW32-000, EAFB02-GW-MW32-000DL, EAFB02-GW-MW32-000 and EAFB02-GW-003-000 DL.

2a. The samples collected on 07/28/2014 and 7/29/2014 were extracted outside the 7 day holding time. All sample results were qualified as "UJ/J".

1. The other samples were stored at a temperature greater than 2X the required QC temperature. All the results of these samples were qualified as "UJ/J".

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified.

Validator's Signature: J. Thomas Kilduff Date: 9/8/2014

SDG 280-58521-1	
DV-LC-0012	
Ground-Water	**Surface water**
EAFB02-GW-MW30-000	EAFB03-SW-001-001
EAFB02-GW-MW32-000	EAFB03-SW-001-901
EAFB03-GW-MW33B-000	
EAFB02-GW-001-000	
EAFB03-GW-MW33A-000	
EAFB03-GW-002-000	
EAFB02-GW-002-000	
EAFB02-GW-003-000	
EAFB01-GW-53M04B-000	
EAFB01-GW-20M14B-000	
EAFB01-GW-001-000	
EAFB04-GW-003-000	
EAFB04-GW-001-000	
EAFB01-GW-20MW32-000	
EAFB01-GW-20MW32-900	
EAFB04-GW-002-000	
EAFB04-GW-004-000	

Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client: SCF	Project Manager: DOUG HAWN	Date: 7/29/14	Chain of Custody Number: 190611
Address: 1006 FLOYD CULLER CT	Telephone Number (Area Code)/Fax Number: (865) 481-7837	Lab Number:	Page 2 of 2
City: OAK RIDGE / State: TN / Zip Code: 37830	Site Contact:	Lab Contact:	
Project Name and Location (State): AF MULTI BASE INVESTIGATION - EIELSON AFB ALASKA	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: DFC	Special Instructions/ Conditions of Receipt
EAFB04-GW-001-000	7/29/14	1745		X			4						X	
EAFB01-GW-20MW32-000	7/30/14	1040		X			8						X	+ MS/MSD
EAFB04-GW-20MW32-900	7/30/14	1045		X			4						X	EAFB01-GW-20MW32-900
EAFB-RS-01	7/30/14	1250		X			4						X	
EAFB-RS-02	7/30/14	1300		X			4						X	
EAFB-RS-03	7/30/14	1310		X			4						X	
EAFB04-GW-002-000	7/30/14	1300		X			4						X	
EAFB04-GW-004-000	7/30/14	1405		X			4						X	
EAFB03-SW-001-001	7/30/14	1515		X			8						X	+ MS/MSD
EAFB03-SW-001-901	7/30/14	1519		X			4						X	
~~EAFB03~~ EAFB03-SD-001-001 (HM)	7/30/14	1520			X		2						X	+ MS/MSD HM
EAFB03-SD-001-901 (HM)	7/30/14	1525			X		1						X	HM

Page 894 of 895

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STANDARD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: [signature]	7/31/14	0900	1. Received By: [signature]	04Aug14	0955
2. Relinquished By			2. Received By: [signature]		
3. Relinquished By			3. Received By		

Comments: Cooler 31 of 2 (WATER)

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

ICE MEthod

Sampler ID

Temperature on Receipt 13.9 5.8 IR-STO.3 (A) 04Aug14

Drinking Water? Yes ☐ No ☒

TestAmeri

THE LEADER IN ENVIRONMENTAL T

280-58521 Chain of Custody

TAL-4124-280 (0506)

Client	Project Manager	Date	Chain of Custody Number
SCF	DOUG HAWN	7/28/14	190622
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 2**
1006 FLOYD CULLER CT	(865) 481-7837		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
OAK RIDGE / TN / 37830			
Project Name and Location (State) ALASKA	**Carrier/Waybill Number**		
AF MULTIBASE INVESTIGATION-EIELSON			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	Analysis: RFC	Special Instructions/ Conditions of Receipt
EAFB02-GW-MW30-000	7/28/14	1230		X			4						X	
EAFB02-GW-MW32-000	7/28/14	1330		X			4						X	
EAFB03-GW-MW33B-000	7/28/14	1440		X			4						X	
EAFB02-GW-001-000	7/28/14	1440		X			4						X	
EAFB03-GW-MW33A-000	7/29/14	0945		X			4						X	
EAFB03-GW-002-000	7/29/14	1005		X			4						X	
EAFB02-GW-002-000	7/29/14	1120 1145 MS		X			4						X	TIME ~~1130~~ 1130
EAFB02-GW-003-000		1220		X			4						X	
EAFB01-GW-53M04B-000		1450		X			4						X	
EAFB01-GW-20M14B-000		1550		X			4						X	
EAFB01-GW-001-000		1455		X			4						X	
EAFB04-GW-003-000	7/29/14	1705		X			4						X	

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Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STANDARD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	7/31/14	0900	1. Received By	04Aug14	0955 ~~1515~~ JM 8/4/14
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

COOLER 1 of 2 (WATER)

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW30-000**

Lab Sample ID: 280-58521-1
Client Matrix: Water

Date Sampled: 07/28/2014 1230
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237835	Lab File ID:	PC514H21120.d
Dilution:	1.0			Initial Weight/Volume:	252.1 mL
Analysis Date:	08/22/2014 1056			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0950			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.83	H	0.0082	0.020	J 2a
Perfluorobutanoic acid (PFBA)	0.92	H	0.0097	0.020	
Perfluorodecane sulfonate (PFDS)	0.022	H M	0.0091	0.020	
Perfluorodecanoic acid (PFDA)	0.0099	U H M	0.0078	0.020	UJ 2a
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.030	UJ 2a
Perfluorononanoic acid (PFNA)	0.42	H	0.017	0.040	J 1D, 2a
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.015	0.030	UJ 2a, 10
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.018	0.040	J 10
Perfluoroundecanoic acid (PFUnA)	0.0099	U H M	0.0068	0.020	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		60 - 155
13C8 PFOS	120		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW30-000**

Lab Sample ID: 280-58521-1
Client Matrix: Water

Date Sampled: 07/28/2014 1230
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237835	Lab File ID:	PC514H20127.d
Dilution:	1.0			Initial Weight/Volume:	252.1 mL
Analysis Date:	08/22/2014 1319	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0950			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluoroheptanoic acid (PFHpA)	2.5	H	0.013	0.030
Perfluorohexane Sulfonate (PFHxS)	20	H	0.0069	0.030
Perfluorohexanoic acid (PFHxA)	4.7	H	0.0029	0.020
Perfluorooctane Sulfonate (PFOS)	82	H M	0.013	0.030
Perfluorooctanoic acid (PFOA)	3.5	H	0.0097	0.020
Perfluoropentanoic acid (PFPA)	3.6	H	0.011	0.030

RW Qual J 10, 2a

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	84	D	60 - 155
13C8 PFOS	94	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW32-000**

Lab Sample ID: 280-58521-2
Client Matrix: Water

Date Sampled: 07/28/2014 1330
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237835	Lab File ID:	PC514H21121.d
Dilution:	1.0			Initial Weight/Volume:	251.2 mL
Analysis Date:	08/22/2014 1108			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0950			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorodecane sulfonate (PFDS)	0.86	H Q	0.0091	0.020	J 7a,7,2a,10
Perfluorodecanoic acid (PFDA)	0.32	H	0.0078	0.020	J 7a,7,2a,10
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.030	UJ 2a
Perfluorononanoic acid (PFNA)	0.33	H	0.017	0.040	J 7a,7,2a,10
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.015	0.030	UJ 2a,10
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.018	0.040	↓ ↓ ,10
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0069	0.020	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	100		60 - 155
13C8 PFOS	205	Q	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW32-000**

Lab Sample ID: 280-58521-2
Client Matrix: Water

Date Sampled: 07/28/2014 1330
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237835	Lab File ID:	PC514H20128.d
Dilution:	1.0			Initial Weight/Volume:	251.2 mL
Analysis Date:	08/22/2014 1331	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0950			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	1.3	H Q	0.0082	0.020
Perfluorobutanoic acid (PFBA)	3.1	H	0.0098	0.020
Perfluoroheptanoic acid (PFHpA)	4.0	H	0.013	0.030
Perfluorohexane Sulfonate (PFHxS)	31	H Q	0.0069	0.030
Perfluorohexanoic acid (PFHxA)	25	H	0.0029	0.020
Perfluorooctane Sulfonate (PFOS)	2000	H J Q	0.013	0.030
Perfluorooctanoic acid (PFOA)	18	H	0.0097	0.020
Perfluoropentanoic acid (PFPA)	9.8	H	0.011	0.030

Rev Qual J 7a, 12a, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	76	D	60 - 155
13C8 PFOS	474	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB03-GW-MW33B-000

Lab Sample ID: 280-58521-3
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21080.d
Dilution:	1.0			Initial Weight/Volume:	259.2 mL
Analysis Date:	08/22/2014 0243			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual	Qual
Perfluorobutane Sulfonate (PFBS)	0.014	J H	0.0079	0.019	J	2a
Perfluorobutanoic acid (PFBA)	0.067	H	0.0095	0.019		
Perfluorodecane sulfonate (PFDS)	0.014	J H	0.0088	0.019		
Perfluorodecanoic acid (PFDA)	0.012	J H	0.0075	0.019		
Perfluorododecanoic acid (PFDoA)	0.019	U H	0.014	0.029	UJ	2a
Perfluoroheptanoic acid (PFHpA)	0.021	J H	0.013	0.029	J	2a
Perfluorohexane Sulfonate (PFHxS)	0.45	H	0.0067	0.029		
Perfluorohexanoic acid (PFHxA)	0.060	H	0.0028	0.019		
Perfluorononanoic acid (PFNA)	0.24	H	0.017	0.039	J	10,2a
Perfluorooctanoic acid (PFOA)	0.095	H	0.0094	0.019	J	2a
Perfluoropentanoic acid (PFPA)	0.068	H	0.011	0.029	J	2a
Perfluorotetradecanoic acid (PFTeA)	0.019	U H	0.014	0.029	UJ	2a
Perfluorotridecanoic Acid (PFTriA)	0.019	U H	0.017	0.039	UJ	2a,10
Perfluoroundecanoic acid (PFUnA)	0.0096	U H	0.0066	0.019	J	2a,10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	103		60 - 155
13C8 PFOS	121		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-MW33B-000**

Lab Sample ID: 280-58521-3
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21106.d
Dilution:	1.0			Initial Weight/Volume:	259.2 mL
Analysis Date:	08/22/2014 0803	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonate (PFOS)	20	H	0.013	0.029

Rev Qual J 2a, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	115	D	60 - 155
13C8 PFOS	117	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-001-000**

Lab Sample ID: 280-58521-4
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21081.d
Dilution:	1.0			Initial Weight/Volume:	207.1 mL
Analysis Date:	08/22/2014 0255			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.20	H	0.0099	0.024	J 2a
Perfluorobutanoic acid (PFBA)	0.35	H	0.012	0.024	J 2a
Perfluorodecane sulfonate (PFDS)	0.012	U H	0.011	0.024	UJ 2a
Perfluorodecanoic acid (PFDA)	0.0098	J H	0.0094	0.024	J ↓
Perfluorododecanoic acid (PFDoA)	0.024	U H	0.018	0.036	UJ
Perfluoroheptanoic acid (PFHpA)	0.52	H	0.016	0.036	J
Perfluorohexanoic acid (PFHxA)	2.1	H	0.0035	0.024	J ↓
Perfluorononanoic acid (PFNA)	0.057	H	0.021	0.048	J 2a,10
Perfluorooctanoic acid (PFOA)	1.6	H	0.012	0.024	J 2a
Perfluoropentanoic acid (PFPA)	1.4	H	0.013	0.036	J ↓
Perfluorotetradecanoic acid (PFTeA)	0.024	U H	0.018	0.036	UJ ,10
Perfluorotridecanoic Acid (PFTriA)	0.024	U H	0.021	0.048	,10
Perfluoroundecanoic acid (PFUnA)	0.012	U H	0.0083	0.024	↓ ↓

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		60 - 155
13C8 PFOS	121		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-001-000**

Lab Sample ID: 280-58521-4
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21107.d
Dilution:	1.0			Initial Weight/Volume:	207.1 mL
Analysis Date:	08/22/2014 0815	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorohexane Sulfonate (PFHxS)	5.9	H Q	0.0084	0.036	J 7a,2a,10
Perfluorooctane Sulfonate (PFOS)	30	H Q	0.016	0.036	J 7a,2a,10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	109	D	60 - 155
13C8 PFOS	131	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-MW33A-000**

Lab Sample ID: 280-58521-5
Client Matrix: Water

Date Sampled: 07/29/2014 0945
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21082.d
Dilution:	1.0			Initial Weight/Volume:	243.7 mL
Analysis Date:	08/22/2014 0308			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutanoic acid (PFBA)	1.5	H	0.010	0.021	J 7a,2a
Perfluorodecane sulfonate (PFDS)	0.010	U H Q	0.0094	0.021	UJ 2a
Perfluorodecanoic acid (PFDA)	0.010	U H	0.0080	0.021	↓ ↓
Perfluorododecanoic acid (PFDoA)	0.021	U H	0.015	0.031	↓ ↓
Perfluorononanoic acid (PFNA)	0.092	H M	0.018	0.041	J 10,2a
Perfluorotetradecanoic acid (PFTeA)	0.021	U H	0.015	0.031	UJ 2a,10
Perfluorotridecanoic Acid (PFTriA)	0.021	U H	0.018	0.041	↓ ,10
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0071	0.021	↓ ↓

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	96		60 - 155
13C8 PFOS	150	Q	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB03-GW-MW33A-000

Lab Sample ID: 280-58521-5
Client Matrix: Water

Date Sampled: 07/29/2014 0945
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21109.d
Dilution:	1.0			Initial Weight/Volume:	243.7 mL
Analysis Date:	08/22/2014 0840	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	2.4	H	0.0085	0.021
Perfluoroheptanoic acid (PFHpA)	4.2	H	0.014	0.031
Perfluorohexane Sulfonate (PFHxS)	130	H J	0.0072	0.031
Perfluorohexanoic acid (PFHxA)	14	H	0.0030	0.021
Perfluorooctane Sulfonate (PFOS)	22	H M	0.014	0.031
Perfluorooctanoic acid (PFOA)	250	H J	0.010	0.021
Perfluoropentanoic acid (PFPA)	5.3	H	0.011	0.031

Rw Qual
J 10,2a

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	131	D	60 - 155
13C8 PFOS	122	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB03-GW-002-000

Lab Sample ID: 280-58521-6
Client Matrix: Water

Date Sampled: 07/29/2014 1005
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21083.d
Dilution:	1.0			Initial Weight/Volume:	248.1 mL
Analysis Date:	08/22/2014 0320			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	RW Qual
Perfluorobutane Sulfonate (PFBS)	0.82	H	0.0083	0.020	2a
Perfluorobutanoic acid (PFBA)	0.67	H	0.0099	0.020	
Perfluorodecane sulfonate (PFDS)	0.010	J H	0.0092	0.020	
Perfluorodecanoic acid (PFDA)	0.010	U H	0.0079	0.020	
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.030	
Perfluoroheptanoic acid (PFHpA)	0.23	H	0.013	0.030	
Perfluorohexane Sulfonate (PFHxS)	1.3	H	0.0070	0.030	
Perfluorononanoic acid (PFNA)	0.018	J H	0.018	0.040	
Perfluorooctanoic acid (PFOA)	0.40	H	0.0099	0.020	
Perfluoropentanoic acid (PFPA)	2.3	H	0.011	0.030	
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.015	0.030	
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.018	0.040	
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0069	0.020	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104		60 - 155
13C8 PFOS	110		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-002-000**

Lab Sample ID: 280-58521-6
Client Matrix: Water

Date Sampled: 07/29/2014 1005
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21110.d
Dilution:	1.0			Initial Weight/Volume:	248.1 mL
Analysis Date:	08/22/2014 0852	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorohexanoic acid (PFHxA)	3.1	H	0.0029	0.020	4 2a,10
Perfluorooctane Sulfonate (PFOS)	9.3	H	0.013	0.030	4 2a,10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	109	D	60 - 155
13C8 PFOS	108	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-002-000**

Lab Sample ID: 280-58521-7
Client Matrix: Water

Date Sampled: 07/29/2014 1130
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21084.d
Dilution:	1.0			Initial Weight/Volume:	244.4 mL
Analysis Date:	08/22/2014 0332			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual	2a
Perfluorobutane Sulfonate (PFBS)	0.057	H	0.0084	0.020	J	
Perfluorobutanoic acid (PFBA)	0.18	H	0.010	0.020		
Perfluorodecane sulfonate (PFDS)	0.017	J H	0.0094	0.020	J	
Perfluorodecanoic acid (PFDA)	0.030	H	0.0080	0.020		
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.031	UJ	
Perfluoroheptanoic acid (PFHpA)	0.43	H	0.014	0.031	J	
Perfluorohexane Sulfonate (PFHxS)	1.8	H	0.0071	0.031		
Perfluorohexanoic acid (PFHxA)	0.61	H	0.0030	0.020		
Perfluorononanoic acid (PFNA)	0.089	H	0.018	0.041		
Perfluorooctanoic acid (PFOA)	0.77	H	0.010	0.020		
Perfluoropentanoic acid (PFPA)	0.64	H	0.011	0.031		
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.015	0.031	UJ	,10
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.018	0.041		,10
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0070	0.020		

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		60 - 155
13C8 PFOS	111		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-002-000**

Lab Sample ID: 280-58521-7
Client Matrix: Water

Date Sampled: 07/29/2014 1130
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21111.d
Dilution:	1.0			Initial Weight/Volume:	244.4 mL
Analysis Date:	08/22/2014 0905	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonate (PFOS)	6.7	H	0.014	0.031

Rev Qual J 2a,10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	101	D	60 - 155
13C8 PFOS	95	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB02-GW-003-000

Lab Sample ID: 280-58521-8
Client Matrix: Water

Date Sampled: 07/29/2014 1220
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21085.d
Dilution:	1.0			Initial Weight/Volume:	251.7 mL
Analysis Date:	08/22/2014 0344			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.050	H	0.0082	0.020	J 2a
Perfluorobutanoic acid (PFBA)	1.2	H	0.0097	0.020	J
Perfluorodecane sulfonate (PFDS)	0.0099	U H	0.0091	0.020	UJ
Perfluorodecanoic acid (PFDA)	0.035	H	0.0078	0.020	J ,10
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.030	UJ
Perfluorohexane Sulfonate (PFHxS)	1.2	H	0.0069	0.030	J
Perfluorononanoic acid (PFNA)	0.39	H	0.017	0.040	J ,10
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.015	0.030	UJ ,10
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.018	0.040	UJ ,10
Perfluoroundecanoic acid (PFUnA)	0.0099	U H	0.0068	0.020	UJ

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		60 - 155
13C8 PFOS	116		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-003-000**

Lab Sample ID: 280-58521-8
Client Matrix: Water

Date Sampled: 07/29/2014 1220
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21112.d
Dilution:	1.0			Initial Weight/Volume:	251.7 mL
Analysis Date:	08/22/2014 0917	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluoroheptanoic acid (PFHpA)	2.5	H	0.013	0.030
Perfluorohexanoic acid (PFHxA)	2.5	H	0.0029	0.020
Perfluorooctane Sulfonate (PFOS)	23	H Q	0.013	0.030
Perfluorooctanoic acid (PFOA)	3.3	H	0.0097	0.020
Perfluoropentanoic acid (PFPA)	4.1	H	0.011	0.030

Rev Qual
J 7a, 2a, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104	D	60 - 155
13C8 PFOS	135	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-53M04B-000**

Lab Sample ID: 280-58521-9
Client Matrix: Water

Date Sampled: 07/29/2014 1450
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21086.d
Dilution:	1.0			Initial Weight/Volume:	255.6 mL
Analysis Date:	08/22/2014 0357			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual	Qual
Perfluorobutane Sulfonate (PFBS)	0.20	H	0.0081	0.020	J	2a, 10
Perfluorobutanoic acid (PFBA)	0.0098	U H	0.0096	0.020	UJ	2a, 10
Perfluorodecane sulfonate (PFDS)	0.0098	U H	0.0089	0.020		2a
Perfluorodecanoic acid (PFDA)	0.0098	U H	0.0076	0.020		
Perfluorododecanoic acid (PFDoA)	0.020	U H	0.015	0.029		
Perfluoroheptanoic acid (PFHpA)	0.96	H	0.013	0.029	J	
Perfluorohexanoic acid (PFHxA)	1.9	H	0.0028	0.020		
Perfluorononanoic acid (PFNA)	0.018	J H	0.017	0.039		
Perfluorooctane Sulfonate (PFOS)	2.0	H	0.013	0.029		
Perfluorooctanoic acid (PFOA)	1.1	H	0.0096	0.020		
Perfluoropentanoic acid (PFPA)	1.5	H	0.011	0.029		
Perfluorotetradecanoic acid (PFTeA)	0.020	U H	0.014	0.029	UJ	,10
Perfluorotridecanoic Acid (PFTriA)	0.020	U H	0.017	0.039		,10
Perfluoroundecanoic acid (PFUnA)	0.0098	U H	0.0067	0.020		

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		60 - 155
13C8 PFOS	115		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-53M04B-000**

Lab Sample ID: 280-58521-9
Client Matrix: Water

Date Sampled: 07/29/2014 1450
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21113.d
Dilution:	1.0			Initial Weight/Volume:	255.6 mL
Analysis Date:	08/22/2014 0929	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorohexane Sulfonate (PFHxS)	2.5	H	0.0068	0.029

Rev Qual
J 2a, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	100	D	60 - 155
13C8 PFOS	110	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-20M14B-000**

Lab Sample ID: 280-58521-10
Client Matrix: Water

Date Sampled: 07/29/2014 1550
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21087.d
Dilution:	1.0			Initial Weight/Volume:	262.1 mL
Analysis Date:	08/22/2014 0409			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Re Qual
Perfluorobutane Sulfonate (PFBS)	0.21	H	0.0079	0.019	J 2a,
Perfluorobutanoic acid (PFBA)	0.14	H	0.0093	0.019	J
Perfluorodecane sulfonate (PFDS)	0.0095	U H	0.0087	0.019	UJ
Perfluorodecanoic acid (PFDA)	0.0095	U H	0.0075	0.019	UJ
Perfluorododecanoic acid (PFDoA)	0.019	U H	0.014	0.029	
Perfluoroheptanoic acid (PFHpA)	0.25	H	0.013	0.029	
Perfluorohexanoic acid (PFHxA)	0.77	H	0.0028	0.019	J
Perfluorononanoic acid (PFNA)	0.019	U H	0.017	0.038	UJ
Perfluorooctanoic acid (PFOA)	0.76	H	0.0093	0.019	J
Perfluoropentanoic acid (PFPA)	0.46	H	0.010	0.029	J
Perfluorotetradecanoic acid (PFTeA)	0.019	U H	0.014	0.029	UJ
Perfluorotridecanoic Acid (PFTriA)	0.019	U H	0.017	0.038	UJ
Perfluoroundecanoic acid (PFUnA)	0.0095	U H	0.0066	0.019	UJ

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		60 - 155
13C8 PFOS	120		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-20M14B-000**

Lab Sample ID: 280-58521-10
Client Matrix: Water

Date Sampled: 07/29/2014 1550
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21114.d
Dilution:	1.0			Initial Weight/Volume:	262.1 mL
Analysis Date:	08/22/2014 0942	Run Type:	DL	Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorohexane Sulfonate (PFHxS)	4.4	H	0.0066	0.029	J 2a, 10
Perfluorooctane Sulfonate (PFOS)	9.7	H	0.013	0.029	J 2a, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	101	D	60 - 155
13C8 PFOS	126	D	45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-001-000**

Lab Sample ID: 280-58521-11
Client Matrix: Water

Date Sampled: 07/29/2014 1455
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21089.d
Dilution:	1.0			Initial Weight/Volume:	243.6 mL
Analysis Date:	08/22/2014 0434			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual 2a
Perfluorobutane Sulfonate (PFBS)	0.0092	U H	0.0085	0.021	UJ
Perfluorobutanoic acid (PFBA)	0.010	U H	0.010	0.021	
Perfluorodecane sulfonate (PFDS)	0.010	U H	0.0094	0.021	
Perfluorodecanoic acid (PFDA)	0.010	U H	0.0080	0.021	
Perfluorododecanoic acid (PFDoA)	0.021	U H	0.015	0.031	
Perfluoroheptanoic acid (PFHpA)	0.021	U H	0.014	0.031	
Perfluorohexane Sulfonate (PFHxS)	0.022	J H	0.0072	0.031	J
Perfluorohexanoic acid (PFHxA)	0.051	H	0.0030	0.021	J
Perfluorononanoic acid (PFNA)	0.021	U H	0.018	0.041	UJ
Perfluorooctane Sulfonate (PFOS)	0.021	U H	0.014	0.031	
Perfluorooctanoic acid (PFOA)	0.010	U H	0.010	0.021	
Perfluoropentanoic acid (PFPA)	0.010	U H	0.011	0.031	
Perfluorotetradecanoic acid (PFTeA)	0.021	U H	0.015	0.031	,10
Perfluorotridecanoic Acid (PFTriA)	0.021	U H	0.018	0.041	,10
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0071	0.021	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	111		60 - 155
13C8 PFOS	112		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB04-GW-003-000

Lab Sample ID: 280-58521-12
Client Matrix: Water

Date Sampled: 07/29/2014 1705
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21090.d
Dilution:	1.0			Initial Weight/Volume:	205.2 mL
Analysis Date:	08/22/2014 0446			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.015	J H	0.010	0.024	J, 10
Perfluorobutanoic acid (PFBA)	0.10	H	0.012	0.024	J, 10
Perfluorodecane sulfonate (PFDS)	0.012	U H	0.011	0.024	U, 10
Perfluorodecanoic acid (PFDA)	0.012	U H	0.0095	0.024	U, 10
Perfluorododecanoic acid (PFDoA)	0.024	U H	0.018	0.037	U, 10
Perfluoroheptanoic acid (PFHpA)	0.081	H	0.016	0.037	J, 10
Perfluorohexane Sulfonate (PFHxS)	0.24	H	0.0085	0.037	J, 10
Perfluorohexanoic acid (PFHxA)	0.74	H	0.0035	0.024	J, 10
Perfluorononanoic acid (PFNA)	0.024	U H	0.021	0.049	U, 10
Perfluorooctane Sulfonate (PFOS)	0.29	H	0.016	0.037	J, 10
Perfluorooctanoic acid (PFOA)	0.030	H	0.012	0.024	J, 10
Perfluoropentanoic acid (PFPA)	0.064	H	0.013	0.037	J, 10
Perfluorotetradecanoic acid (PFTeA)	0.024	U H	0.018	0.037	U, 10
Perfluorotridecanoic Acid (PFTriA)	0.024	U H	0.022	0.049	U, 10
Perfluoroundecanoic acid (PFUnA)	0.012	U H	0.0084	0.024	U, 10

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		60 - 155
13C8 PFOS	107		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-001-000**

Lab Sample ID: 280-58521-13
Client Matrix: Water

Date Sampled: 07/29/2014 1745
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21091.d
Dilution:	1.0			Initial Weight/Volume:	238.6 mL
Analysis Date:	08/22/2014 0458			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.0094	U H	0.0086	0.021	UJ 2a
Perfluorobutanoic acid (PFBA)	0.010	U H	0.010	0.021	
Perfluorodecane sulfonate (PFDS)	0.010	U H	0.0096	0.021	
Perfluorodecanoic acid (PFDA)	0.010	U H	0.0082	0.021	
Perfluorododecanoic acid (PFDoA)	0.021	U H	0.016	0.031	
Perfluoroheptanoic acid (PFHpA)	0.018	J H	0.014	0.031	J
Perfluorohexane Sulfonate (PFHxS)	0.089	H	0.0073	0.031	
Perfluorohexanoic acid (PFHxA)	0.026	H	0.0030	0.021	
Perfluorononanoic acid (PFNA)	0.021	U H	0.018	0.042	UJ
Perfluorooctane Sulfonate (PFOS)	0.14	H	0.014	0.031	J
Perfluorooctanoic acid (PFOA)	0.021	H	0.010	0.021	
Perfluoropentanoic acid (PFPA)	0.028	J H	0.011	0.031	
Perfluorotetradecanoic acid (PFTeA)	0.021	U H	0.015	0.031	UJ 1,10
Perfluorotridecanoic Acid (PFTriA)	0.021	U H	0.019	0.042	1,10
Perfluoroundecanoic acid (PFUnA)	0.010	U H	0.0072	0.021	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	111		60 - 155
13C8 PFOS	102		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB01-GW-20MW32-000

Lab Sample ID: 280-58521-14
Client Matrix: Water

Date Sampled: 07/30/2014 1040
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method: DV-LC-0012
Prep Method: 3535
Dilution: 1.0
Analysis Date: 08/22/2014 0511
Prep Date: 08/06/2014 1015

Analysis Batch: 280-240059
Prep Batch: 280-237662

Instrument ID: LC_LCMS5
Lab File ID: PC514H21092.d
Initial Weight/Volume: 260.6 mL
Final Weight/Volume: 5 mL
Injection Volume: 25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual	
Perfluorobutane Sulfonate (PFBS)	0.037	J	0.0079	0.019	J	1
Perfluorobutanoic acid (PFBA)	0.12	J	0.0094	0.019	J	
Perfluorodecane sulfonate (PFDS)	0.0096	U	0.0088	0.019	UJ	
Perfluorodecanoic acid (PFDA)	0.0096	U	0.0075	0.019		
Perfluorododecanoic acid (PFDoA)	0.019	U J	0.014	0.029	J	
Perfluoroheptanoic acid (PFHpA)	0.41	J	0.013	0.029		
Perfluorohexane Sulfonate (PFHxS)	1.3	J	0.0067	0.029		
Perfluorohexanoic acid (PFHxA)	0.46	J	0.0028	0.019		
Perfluorononanoic acid (PFNA)	0.055	J	0.017	0.038		
Perfluorooctane Sulfonate (PFOS)	1.5	J	0.013	0.029	J	8a,1
Perfluorooctanoic acid (PFOA)	0.69	J	0.0094	0.019	J	1
Perfluoropentanoic acid (PFPA)	0.34	J	0.010	0.029	UJ	,10
Perfluorotetradecanoic acid (PFTeA)	0.019	U	0.014	0.029	UJ	,10
Perfluorotridecanoic Acid (PFTriA)	0.019	U	0.017	0.038		
Perfluoroundecanoic acid (PFUnA)	0.0096	U J	0.0066	0.019	UJ	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		60 - 155
13C8 PFOS	102		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB01-GW-20MW32-900

Lab Sample ID: 280-58521-15
Client Matrix: Water

Date Sampled: 07/30/2014 1045
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21095.d
Dilution:	1.0			Initial Weight/Volume:	263 mL
Analysis Date:	08/22/2014 0548			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	0.025		0.0078	0.019
Perfluorobutanoic acid (PFBA)	0.063		0.0093	0.019
Perfluorodecane sulfonate (PFDS)	0.0095	U	0.0087	0.019
Perfluorodecanoic acid (PFDA)	0.0095	U	0.0074	0.019
Perfluorododecanoic acid (PFDoA)	0.019	U	0.014	0.029
Perfluoroheptanoic acid (PFHpA)	0.23		0.013	0.029
Perfluorohexane Sulfonate (PFHxS)	0.83		0.0066	0.029
Perfluorohexanoic acid (PFHxA)	0.23		0.0028	0.019
Perfluorononanoic acid (PFNA)	0.033	J	0.017	0.038
Perfluorooctane Sulfonate (PFOS)	0.93		0.013	0.029
Perfluorooctanoic acid (PFOA)	0.39		0.0093	0.019
Perfluoropentanoic acid (PFPA)	0.17		0.010	0.029
Perfluorotetradecanoic acid (PFTeA)	0.019	U	0.014	0.029
Perfluorotridecanoic Acid (PFTriA)	0.019	U	0.017	0.038
Perfluoroundecanoic acid (PFUnA)	0.0095	U	0.0065	0.019

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		60 - 155
13C8 PFOS	111		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-002-000**

Lab Sample ID: 280-58521-19
Client Matrix: Water

Date Sampled: 07/30/2014 1300
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21100.d
Dilution:	1.0			Initial Weight/Volume:	211 mL
Analysis Date:	08/22/2014 0649			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.011	U	0.0098	0.024	1
Perfluorobutanoic acid (PFBA)	0.012	U	0.012	0.024	
Perfluorodecane sulfonate (PFDS)	0.012	U	0.011	0.024	
Perfluorodecanoic acid (PFDA)	0.012	U	0.0093	0.024	
Perfluorododecanoic acid (PFDoA)	0.024	U	0.018	0.036	
Perfluoroheptanoic acid (PFHpA)	0.027	J	0.016	0.036	1, 10
Perfluorohexane Sulfonate (PFHxS)	0.059		0.0083	0.036	
Perfluorohexanoic acid (PFHxA)	0.035		0.0034	0.024	1, 10
Perfluorononanoic acid (PFNA)	0.024	U	0.021	0.047	1
Perfluorooctane Sulfonate (PFOS)	0.080		0.016	0.036	
Perfluorooctanoic acid (PFOA)	0.032		0.012	0.024	
Perfluoropentanoic acid (PFPA)	0.037		0.013	0.036	
Perfluorotetradecanoic acid (PFTeA)	0.024	U	0.017	0.036	1, 10
Perfluorotridecanoic Acid (PFTriA)	0.024	U	0.021	0.047	1, 10
Perfluoroundecanoic acid (PFUnA)	0.012	U	0.0082	0.024	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		60 - 155
13C8 PFOS	107		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB04-GW-004-000

Lab Sample ID: 280-58521-20
Client Matrix: Water

Date Sampled: 07/30/2014 1405
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21101.d
Dilution:	1.0			Initial Weight/Volume:	271.8 mL
Analysis Date:	08/22/2014 0702			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	RW Qual
Perfluorobutane Sulfonate (PFBS)	0.029		0.0076	0.018	1
Perfluorobutanoic acid (PFBA)	0.055		0.0090	0.018	
Perfluorodecane sulfonate (PFDS)	0.0092	U	0.0084	0.018	U
Perfluorodecanoic acid (PFDA)	0.0092	U	0.0072	0.018	U
Perfluorododecanoic acid (PFDoA)	0.018	U	0.014	0.028	U
Perfluoroheptanoic acid (PFHpA)	0.27		0.012	0.028	
Perfluorohexane Sulfonate (PFHxS)	0.31		0.0064	0.028	
Perfluorohexanoic acid (PFHxA)	0.37		0.0027	0.018	
Perfluorononanoic acid (PFNA)	0.018	U	0.016	0.037	U
Perfluorooctane Sulfonate (PFOS)	0.059		0.012	0.028	
Perfluorooctanoic acid (PFOA)	0.069		0.0090	0.018	
Perfluoropentanoic acid (PFPA)	0.22		0.010	0.028	
Perfluorotetradecanoic acid (PFTeA)	0.018	U	0.014	0.028	U, 10
Perfluorotridecanoic Acid (PFTriA)	0.018	U	0.016	0.037	U, 10
Perfluoroundecanoic acid (PFUnA)	0.0092	U	0.0063	0.018	U

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	110		60 - 155
13C8 PFOS	110		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SW-001-001

Lab Sample ID: 280-58521-21
Client Matrix: Water

Date Sampled: 07/30/2014 1515
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21102.d
Dilution:	1.0			Initial Weight/Volume:	267.8 mL
Analysis Date:	08/22/2014 0714			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	ReQual
Perfluorobutane Sulfonate (PFBS)	0.15	J	0.0077	0.019	1
Perfluorobutanoic acid (PFBA)	0.067	M	0.0091	0.019	
Perfluorodecane sulfonate (PFDS)	0.0093	U	0.0085	0.019	,10
Perfluorodecanoic acid (PFDA)	0.0093	U J	0.0073	0.019	,10
Perfluorododecanoic acid (PFDoA)	0.019	U J	0.014	0.028	
Perfluoroheptanoic acid (PFHpA)	0.12	J	0.012	0.028	
Perfluorohexane Sulfonate (PFHxS)	1.2	J	0.0065	0.028	
Perfluorohexanoic acid (PFHxA)	0.47		0.0027	0.019	
Perfluorononanoic acid (PFNA)	0.019	U	0.016	0.037	
Perfluorooctane Sulfonate (PFOS)	2.4	J	0.012	0.028	
Perfluorooctanoic acid (PFOA)	0.53	J	0.0091	0.019	
Perfluoropentanoic acid (PFPA)	0.21		0.010	0.028	
Perfluorotetradecanoic acid (PFTeA)	0.019	U J	0.014	0.028	,10
Perfluorotridecanoic Acid (PFTriA)	0.019	U J	0.017	0.037	,10
Perfluoroundecanoic acid (PFUnA)	0.0093	U J	0.0064	0.019	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		60 - 155
13C8 PFOS	103		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SW-001-901

Lab Sample ID: 280-58521-22
Client Matrix: Water

Date Sampled: 07/30/2014 1519
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-240059	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237662	Lab File ID:	PC514H21105.d
Dilution:	1.0			Initial Weight/Volume:	266.7 mL
Analysis Date:	08/22/2014 0751			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1015			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	0.15		0.0077	0.019
Perfluorobutanoic acid (PFBA)	0.086		0.0092	0.019
Perfluorodecane sulfonate (PFDS)	0.0094	U	0.0086	0.019
Perfluorodecanoic acid (PFDA)	0.0094	U	0.0073	0.019
Perfluorododecanoic acid (PFDoA)	0.019	U	0.014	0.028
Perfluoroheptanoic acid (PFHpA)	0.12		0.012	0.028
Perfluorohexane Sulfonate (PFHxS)	1.1		0.0065	0.028
Perfluorohexanoic acid (PFHxA)	0.49		0.0027	0.019
Perfluorononanoic acid (PFNA)	0.019	U	0.016	0.037
Perfluorooctane Sulfonate (PFOS)	2.1		0.012	0.028
Perfluorooctanoic acid (PFOA)	0.49		0.0092	0.019
Perfluoropentanoic acid (PFPA)	0.21		0.010	0.028
Perfluorotetradecanoic acid (PFTeA)	0.019	U	0.014	0.028
Perfluorotridecanoic Acid (PFTriA)	0.019	U	0.017	0.037
Perfluoroundecanoic acid (PFUnA)	0.0094	U	0.0065	0.019

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Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		60 - 155
13C8 PFOS	106		45 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW30-000**

Lab Sample ID: 280-58521-1
Client Matrix: Water

Date Sampled: 07/28/2014 1230
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08031.d
Dilution:	1.0			Initial Weight/Volume:	246.2 mL
Analysis Date:	08/08/2014 1838			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.016	J H	0.0058	0.051

Rev Qual
J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-MW32-000**

Lab Sample ID: 280-58521-2
Client Matrix: Water

Date Sampled: 07/28/2014 1330
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08032.d
Dilution:	1.0			Initial Weight/Volume:	263.1 mL
Analysis Date:	08/08/2014 1851			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	
Perfluorooctane Sulfonamide (FOSA)	0.83	H	0.0054	0.048	Rev Qual J Eq

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-MW33B-000**

Lab Sample ID: 280-58521-3
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08033.d
Dilution:	1.0			Initial Weight/Volume:	251.8 mL
Analysis Date:	08/08/2014 1903			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.0090	J H	0.0057	0.050

Rev 2nd J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-001-000**

Lab Sample ID: 280-58521-4
Client Matrix: Water

Date Sampled: 07/28/2014 1440
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08034.d
Dilution:	1.0			Initial Weight/Volume:	34.9 mL
Analysis Date:	08/08/2014 1915			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorooctane Sulfonamide (FOSA)	0.051	J H	0.041	0.36	J ZA

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-MW33A-000**

Lab Sample ID: 280-58521-5
Client Matrix: Water

Date Sampled: 07/29/2014 0945
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08035.d
Dilution:	1.0			Initial Weight/Volume:	248.6 mL
Analysis Date:	08/08/2014 1928			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.0095	J H	0.0057	0.050

RW Qual
J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-GW-002-000**

Lab Sample ID: 280-58521-6
Client Matrix: Water

Date Sampled: 07/29/2014 1005
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08037.d
Dilution:	1.0			Initial Weight/Volume:	243.4 mL
Analysis Date:	08/08/2014 1952			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.026	J H	0.0059	0.051

Rev Qual J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-002-000**

Lab Sample ID: 280-58521-7
Client Matrix: Water

Date Sampled: 07/29/2014 1130
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238131	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237840	Lab File ID:	PC514H08038.d
Dilution:	1.0			Initial Weight/Volume:	234.9 mL
Analysis Date:	08/08/2014 2005			Final Weight/Volume:	5 mL
Prep Date:	08/07/2014 0935			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.072	H	0.0061	0.053

Rev Qual
J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB02-GW-003-000**

Lab Sample ID: 280-58521-8
Client Matrix: Water

Date Sampled: 07/29/2014 1220
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07050.d
Dilution:	1.0			Initial Weight/Volume:	239.4 mL
Analysis Date:	08/07/2014 2210			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.016	U H	0.0060	0.052

Rev Qual
UJ 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-53M04B-000**

Lab Sample ID: 280-58521-9
Client Matrix: Water

Date Sampled: 07/29/2014 1450
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07051.d
Dilution:	1.0			Initial Weight/Volume:	225.6 mL
Analysis Date:	08/07/2014 2222			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.017	U H	0.0063	0.055

Rev Qual
UJ 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-20M14B-000**

Lab Sample ID: 280-58521-10
Client Matrix: Water

Date Sampled: 07/29/2014 1550
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07052.d
Dilution:	1.0			Initial Weight/Volume:	250.4 mL
Analysis Date:	08/07/2014 2235			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorooctane Sulfonamide (FOSA)	0.019	J H	0.0057	0.050	J 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-001-000**

Lab Sample ID: 280-58521-11
Client Matrix: Water

Date Sampled: 07/29/2014 1455
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07053.d
Dilution:	1.0			Initial Weight/Volume:	92.4 mL
Analysis Date:	08/07/2014 2247			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorooctane Sulfonamide (FOSA)	0.041	U H	0.015	0.14	UJ 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-003-000**

Lab Sample ID: 280-58521-12
Client Matrix: Water

Date Sampled: 07/29/2014 1705
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07054.d
Dilution:	1.0			Initial Weight/Volume:	237.2 mL
Analysis Date:	08/07/2014 2259			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.016	U H	0.0060	0.053

Rev 2nd us za

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-001-000**

Lab Sample ID: 280-58521-13
Client Matrix: Water

Date Sampled: 07/29/2014 1745
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07055.d
Dilution:	1.0			Initial Weight/Volume:	220.8 mL
Analysis Date:	08/07/2014 2312			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.017	U H	0.0065	0.057

Rev 2 wd
UJ 2a

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-20MW32-000**

Lab Sample ID: 280-58521-14
Client Matrix: Water

Date Sampled: 07/30/2014 1040
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07057.d
Dilution:	1.0			Initial Weight/Volume:	47.4 mL
Analysis Date:	08/07/2014 2336			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ	Rev Qual
Perfluorooctane Sulfonamide (FOSA)	0.079	U	0.030	0.26	UJ

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB01-GW-20MW32-900**

Lab Sample ID: 280-58521-15
Client Matrix: Water

Date Sampled: 07/30/2014 1045
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07060.d
Dilution:	1.0			Initial Weight/Volume:	71.1 mL
Analysis Date:	08/08/2014 0013			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.053	U	0.020	0.18

Re Jud
UJ 1

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-002-000**

Lab Sample ID: 280-58521-19
Client Matrix: Water

Date Sampled: 07/30/2014 1300
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07064.d
Dilution:	1.0			Initial Weight/Volume:	26.8 mL
Analysis Date:	08/08/2014 0102			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.14	U	0.053	0.47

Rev Qual
UJ 1

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-GW-004-000**

Lab Sample ID: 280-58521-20
Client Matrix: Water

Date Sampled: 07/30/2014 1405
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07065.d
Dilution:	1.0			Initial Weight/Volume:	46.3 mL
Analysis Date:	08/08/2014 0115			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.081	U	0.031	0.27

Rev Qual
UJ 1

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-SW-001-001**

Lab Sample ID: 280-58521-21
Client Matrix: Water

Date Sampled: 07/30/2014 1515
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07066.d
Dilution:	1.0			Initial Weight/Volume:	272.2 mL
Analysis Date:	08/08/2014 0127			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.014	U	0.0052	0.046

Rev Qual
UJ 1

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58521-1
Sdg Number: Eielson

Client Sample ID: **EAFB03-SW-001-901**

Lab Sample ID: 280-58521-22
Client Matrix: Water

Date Sampled: 07/30/2014 1519
Date Received: 08/04/2014 0955

PFC -FOSA FOSA in Water (LC/MS/MS)

Analysis Method:	PFC -FOSA	Analysis Batch:	280-238097	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-237694	Lab File ID:	PC514H07070.d
Dilution:	1.0			Initial Weight/Volume:	275.7 mL
Analysis Date:	08/08/2014 0216			Final Weight/Volume:	5 mL
Prep Date:	08/06/2014 1155			Injection Volume:	25 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctane Sulfonamide (FOSA)	0.014	U	0.0052	0.045

Rej Qual
UJ 1

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

I. Technical Holding Times			
A. Sample Preservation, Handling and Transport			
1. Have all samples been preserved correctly?	**Yes**	**No**	**N/A**
2. Have sample temperatures been kept at 4° C (+ or - 2 °)?	**Yes**	**No**	**N/A**
3. Were all samples received in proper condition?	**Yes**	**No**	**N/A**
4. Were any qualifications required based on this information?	**Yes**	**No**	**N/A**
Coolers @ 6.1, 14.2 C—the samples held at 14.2 exceeded the QC criteria by 2X and were qualified as "UJ/J"			
B. Chain of Custody			
1. Were all samples properly recorded on COCs?	**Yes**	**No**	**N/A**
2. Were correct analyses performed on samples?	**Yes**	**No**	**N/A**
C. Holding Times			
1. Were samples extracted and analyzed within acceptable holding times?	**Yes**	**No**	**N/A**
2. Were any qualifications required based on this information?	**Yes**	**No**	**N/A**

Water samples *Sampled* / **Soil and sediment samples**	*7 days* / *14 days*	*extraction* / *extraction*	*40 days* / *40 days*	*Analysis* / *Analysis*
7/28	10 days UJ/J	8/7	batch 240059	8/22
7/29	8 days UJ/J	8/6	batch 240059	8/22
7/30	7 days ok, temp @ 14.2	8/6	batch 240059	8/22

FOSA----Same as for the PFC analyses

II. GC/MS Instrument Performance Check			
1. Were instrument performance check samples run for each analysis period?	**Yes**	**No**	**N/A**
2. Were ion abundance criteria met for BFB analysis?	**Yes**	**No**	**N/A**
3. Do laboratory forms match raw data?	**Yes**	**No**	**N/A**
4. Were any qualifications required based on this information?	**Yes**	**No**	**N/A**

Comments/Qualifications:

None

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

III. Initial Calibration			
1. Were correct numbers (5) and concentrations (5, 10, 50, 100, 200 ng/ul) of standards used for initial calibration standards to establish calibration curve?	Yes	No	N/A
2. Were the RRFs greater than or equal to 0.050? RRF at greater than or equal to 0.010 for the poor response compounds.	Yes	No	N/A
3. Were RRF RSDs within 30%: 40% for compounds exhibiting poor response?	Yes	No	N/A
4. Were retention Times (RTs) within acceptable RT windows?	Yes	No	N/A

Comments/Qualifications:

ICV 8/22@00:03ff 280-240058/3ff
All RRFs are quadr. All R2 = >0.99

PFHxS

RRF			RSD			
4.699			1.45833	2.12673		
3.04			0.20067	0.04026		
3.636			0.39533	0.15628		
2.799			0.44167	0.19506		
3.24			0.00067	4.44E-7		
2.778			0.46267	0.21406		
3.245			0.00433	1.88E-5		
2.727			0.51367	0.26385		
		Mean				
3.002		RRF	0.23867	0.05696		
29.166	9	3.24066		3.05325	0.381657	
					0.62	
					19.1%	% RSD

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

IV.	Continuing Calibration			
	1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	Yes	No	N/A
	2. Were the opening continuing calibration RRFs for semi-volatile organic compounds greater than or equal to 0.050? RRF at greater than or equal to 0.010 for the poor response compounds?	Yes	No	N/A
	3. Was the closing continuing calibration RRFs for semi-volatile organic compounds greater than or equal 0.010 for all compounds?	Yes	No	N/A
	4. Were %D between the initial calibration RRF and the opening continuing calibration RRFs within + or - 30%?	Yes	No	N/A
	5 Were %D between the initial calibration RRF and the closing continuing calibration RRFs within + or - 30% for all responders?	Yes	No	N/A

EAFB03-GW-MW33B-000 thru EAFB01-GW-20M14B-000
CCV 280-240059/24 8/22@ 04:21 %D<13% PFDoA = 10.0-9.80/10.0 = 2.0%
EAFB01-GW-001-000 thru EAFB01-GW-20MW32-900
CCV 280-240059/35 8/22@ 06:37 %D<14% PFHxA = 5.00-4.85/5.00 = 3.0%
EAFB04-GW-002-000 thru EAFB02-GW-002-000DL
CCV 280-240059/44 8/22@08:28 %D<8% PFHpA = 10.5-10.0/10.0 = 5.0%
EAFB03-GW-MW33A-000 DL thru EAFB01-GW-20M14B-000DL
CCV 280-240059/54 8/22@10:31 %D<15% PFHpA = 5.53-5.00/5.00 = 10.6%
EAFB02-GW-MW30-000 and EAFB02-GW-MW32-000
CCV 280-240059/61 8/22@11:57 %D<11% PFBA = 10.0-9.62/10.0 = 3.8%
EAFB02-GW-MW30-000DL and EAFB02-GW-MW32-000DL
CCV 280-240059/65 8/22@13:44 %D<11% PFBA = 5.00-4.98/5.00 = 0.4%

FOSA---all CCV's %Ds <10.0%

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

V. Blanks			
1. Were any target or non-target compounds reported in laboratory prep or calibration blanks?	**Yes**	No	**N/A**
2. Were method blank analyses performed at required frequency, and for each GC/MS system used to analyze samples for each type of analysis (i.e., matrix)?	Yes	**No**	**N/A**
3. Were any qualifications required based on this information? Based on the 5X rule or Table 6 in the guidelines: Blank <CRQL: sample <CRQL then U Blank >/=CRQL: sample <CRQL then U Blank >CRQL: sample >CRQL but <blank then U	**Yes**	No	**N/A**

Comments/Qualifications:

MB 280-237662/1-A 8/22@02:18 all non-detects
MB 280-237835/2-A 8/22@09:42 all non-detects
FOSA MB 280-237694/1-A@8/6@11:55 U's
MB 280-237840/1-A@8/8@17:37 U's

VI. System Monitoring Compounds (Surrogate Spikes)			
1. Were laboratory surrogate recoveries calculated and reported correctly?	Yes	**No**	**N/A**
2. Were surrogate recoveries within acceptable limits?	**Yes**	No	**N/A**
3. Were any qualifications required based on surrogate spike QC information?	Yes	**No**	**N/A**

Comments/Qualifications

surrogate		**13C8 PFOA**	**13C8 PFOS**
QC criteria		Water (60-155)	(45-130)
Range	Reg. & Dil	**SW**: 105&108% **GW:** 76-131%	103&106% 94-474% EAFB02-GW-001-000 –detects "J" EAFB02-GW-MW32-000 –detects "J" EAFB02-GW-MW32-000 DL –detects "J" EAFB03-GW-MW33A-000 –detects "J" EAFB02-GW-003-000 DL –detects "J"

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

VII. Matrix Spikes/Matrix Spike Duplicates			
1. Were MS/MSD samples analyzed at required frequency for each ample matrix?	Yes	No	N/A
2. Were MS/MSD results for recovery and RPD within advisory limits?	Yes	No	N/A
3. Were Samples used for MS/MSD field blanks?	Yes	No	N/A
4. Were laboratory reported results correctly calculated from raw data?	Yes	No	N/A
5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information? parent sample only	Yes	No	N/A

Comments/Qualifications

EAFB01-GW-20MW32-000 MS/MSD
8/22@05:23/05:35
*MS= PFOA -Low-**UJ/J**
MS = -701-114%
MSD = 88-107%, ***RPDs: 0-11%
*MSD=PFOA -High-**UJ/J**

* **2** of MS/MSD recoveries outside the QC limit sample conc >4x spike—no quals needed.
** 4 cpds had low MS recoveries and 4 had high MSD recoveries, but none had both so no quals were added.
*** 8 RPDS were outside the QC limits.

EAFB03-SW-001-001 MS/MSD
8/22@07:26/07:39
*MS = PFDoA,PFTeA,PFUnA,-high-**J-all non-detects.**
MS = 58-4958%
MSD = 52-3581%, RPDs@0-27%
*MSD = PFDoA, PFTeA, PFUnA,-high-**J-all non-detects.**
PFOA MS = 0.829-0.53/0.187 = 159.9%
MSD = 0.731-0.53/0.189 = 106.3%
RPD = 0.098/0.250 = 39%

*2 of MS/MSD recoveries outside the QC limit sample conc >4x spike—no quals needed.
** 5 cpds had high MS recoveries but the MSD recoveries were okay so no quals were added.
*** 1 RPD was outside the QC limits.

FOSA **EAFB03-SW-001-001** MS = 0.191/0.182 = 104.9%
MSD = 0.192/0.181 = 106.1%
RPD = 0.001/0.1915 = 0.5%

EAFB01-GW-20MW32-000 MS = 0.196/0.194 = 101%
MSD = 0.199/0.194 = 102.6%
RPD = 0.003/0.1975 = 1.5%

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

VIII. Laboratory Control Sample (LCS)			
1. Were LCS samples run at correct frequency for each matrix samples?	Yes	No	N/A
2. Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?	Yes	No	N/A
4. Were any qualifications required based on LCS data in conjunction with other QC information?	Yes	No	N/A

Comments/Qualifications:

LCS 280-237662/2-A 8/22@02:31: 76-107%
PFNA = 0.191/0.200 = 90.5%

FOSA
LCS 280-237694/2A = 98%
LCS 280-237840/2A = 97%
LCSD 280-237840/2A = 106%
RPD = 9%

LCS 280-237835/2-A 8/22@10:06: 80-110%
PFDA = 0.205/0.0200 = 102.5%

LCSD 280-237835/2-A 8/22@10:19: 68-105%
PFDA = 0.199/0.200 = 99.5%
RPDs: 0-19
PFDA = 0.006/0.202 = 3.0%

IX. Internal Standards			
1. Were standard area counts within a factor of -36% to +130%, and -60 to +155% from associated calibration standard?	Yes	No	N/A
2. Were retention times of internal standard within + or - 30 seconds of retention time of associated calibration check?	Yes	No	N/A
3. Were any qualifications required based on internal standard results?	Yes	No	N/A

Comments/

See Attached Sheet for samples with low area count recoveries and qualifiers.

All FOSA ISs within the QC limits.

Worksheet for Eielson SDG 58521 Internal Standards

GW's and SW's

The following IS area count recoveries were below the QC criteria

Samples	IS Low Recovery Area Count	Qualifiers
…53M04B…	BA	UJ/J
...MW33A...	HXA,HXS,OA,PFOS,NA	UJ/J
...MW33B....	PFOS,NA	UJ/J
EAFB02-GW-001-000	HXS,PFOS,NA	UJ/J
…20MW32-900…	BA,HXA,HXS,DA	UJ/J
EAFB04-GW-003-000	HXS,DA,UNA,DOA	UJ/J
EAFB04-GW-002-000	HXA	UJ/J
EAFB02-GW-003-000	OA,PFOS,NA,DA	UJ/J
EAFB03-GW-001-001	DA	UJ/J
EAFB03-GW-001-901	DA, UNA	UJ/J
EAFB02-GW-MW32…	HXA,HXS,OA,PFOS,NA,DA	UJ/J
EAFB02-GW-MW30…	HXS,OA,PFOS,NA	UJ/J
GW and SW DLs	All ISs	UJ/J
All samples	FOSA	UJ/J

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

X/XI. Compound Identification/Quantification and Reported Contract Required Quantification Limits (CRQLs) 1. Were sample results correctly calculated and reported by laboratory?	**Yes**	**No**	**N/A**
2 Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	**Yes**	**No**	**N/A**
3. Were CRQLs adjusted to reflect sample dilutions and dry weight factors not accounted for by the method? Percent moisture >70% moisture< 90%: nondetects-UJ detects-J. Moisture> 90% then nondetects-R detects-J.	**Yes**	**No**	**N/A**
4. Were any laboratory QA/QC sample results calculated from peaks derived using manual integration?	**Yes**	**No**	**N/A**
5. Were any qualifications required based on this information?	**Yes**	**No**	**N/A**
Comments/Qualifications: **No raw data review---level III**			
XII. Field QC			
1. Were any Field Duplicates associated with this SDG?	**Yes**	**No**	**N/A**
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	**Yes**	**No**	**N/A**
2. Were any field blanks or equipment rinsates associated with this SDG?	**Yes**	**No**	**N/A**
a. If yes, were any compounds reported in samples >IDL?	**Yes**	**No**	**N/A**
b. Were any qualifications required based on this information?	**Yes**	**No**	**N/A**
Comments/Qualifications: **SEE ATTACHED SHEETS** **EAFB-RS-001—all U's** **EAFB-RS-002—all U's** **EAFB-RS-003—all U's**			

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58521-1 **Matrix/No. Samples:** G-water-11, S-water-4

XIII. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	**Yes**	No	**N/A**
Comments/Qualifications:			

Eielson AFB: Field Duplicates SDG 280-58521-1

Samples: EAFB01-GW-20MW32-000/ EAFB01-GW-20MW32-900				
Result	**Compound**	**Result**	**RPD (%)**	**Qualifier**
0.037	Perfluorobutane Sulfonate	0.25	204.1	J
0.12	Perfluorobutanoic acid	0.063	62.3	
0.41	Perfluoroheptanoic acid	0.23	56.3	
1.3	Perfluorohexane Sulfonate	0.83	44.1	
0.46	Perfluorohexanoic acid	0.23	66.7	
0.055	Perfluorononanoic acid	0.033	50.0	
1.5	Perfluorooctane Sulfonate	0.93	46.9	
0.69	Perfluorooctanoic acid	0.39	29.0	
0.34	Perfluoropentanoic acid	0.17	66.7	
0.079	FOSA	0.053	39.4	

Samples: EAFB03-SW-001-001/ EAFB03-SW-001-901				
Result	Compound	Result	RPD (%)	Qualifier
0.15	Perfluorobutane Sulfonate	0.15	0	
0.067	Perfluorobutanoic acid	0.086	24.8	
0.12	Perfluoroheptanoic acid	0.12	0	
1.2	Perfluorohexane Sulfonate	1.1	8.7	
0.47	Perfluorohexanoic acid	0.49	4.2	
2.4	Perfluorooctane Sulfonate	2.1	13.3	
0.53	Perfluorooctanoic acid	0.49	7.8	
0.21	Perfluoropentanoic acid	0.21	0	

SDG: 280-58523-1 Project: Eielson AFB

Method: PFCs DV-LC-0012 # Samples: Soils-24, Sed-1,

Validation Samples: See attached sheet

Data Validation Report Summary

		Status Code	Comments
1.	Sample Preservation, Handling, and Transport	A	
2.	Chain of Custody	A	
3.	Holding Times	A	
4.	GC/MS Tune/Inst Perf	A	
5.	Calibrations	A	
6.	Blanks	A	
7.	Blank Spike/LCS	A	
8.	Matrix Spike	A	
9.	Surrogates	A	
10.	Internal Standards	X	
11.	Compound Identification	A	
12.	System Performance	A	
13.	Field QC Samples	A	
14.	Overall Assessment	X	

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

10a. Low area count recoveries for Perfluorooctanoic Sulfonate in sample EAFB03-SB-001-001, Perfluorononanoic acid in samples EAFB03-SB-001-001and EAFB03-SB-004-010 resulted in these compounds being qualified as "UJ/J". All compounds were below the QC criteria in EAFB03-SB-001-001DL, EAFB03-SB-004-010DL and results were qualified as "J".

Significant Findings/Recommendations:

#1--The client's instructed, on August 8, 2014, was that all analyses for sample EAFB03-SD-001-901 (280-58523-26) were to be cancelled. The sample was water and rocks.

Overall Data Quality:

Acceptable as qualified.

Validator's Signature: J. Thomas Kitchens Date: 9/6/2014

Samples from Eielson AFB SDG 58523

Soils	Sediment
EAFB03-SB-001-001	EAFB03-SD-001-001
EAFB03-SB-004-010	
EAFB03-SB-003-009	
EAFB03-SB-002-010	
EAFB02-SB-001-001	
EAFB02-SB-001-008	
EAFB02-SB-002-001	
EAFB02-SB-002-005	
EAFB02-SB-003-003	
EAFB01-SB-003-001	
EAFB01-SB-003-006	
EAFB01-SB-001-001	
EAFB01-SB-001-901	
EAFB01-SB-001-002	
EAFB01-SB-001-902	
EAFB03-SB-001-010	
EAFB01-SB-002-001	
EAFB01-SB-002-003	
EAFB04-SB-001-004	
EAFB04-SB-001-001	
EAFB04-SB-003-002	
EAFB04-SB-002-001	
EAFB04-SB-002-008	
EAFB04-SB-004-005	

Chain of Custody Record

Sampler ID _____

Temperature on Receipt 0.2, 4.5, 1.5 (3) @ 04Aug14

Drinking Water? Yes ☐ No ☒

TestAmeri

THE LEADER IN ENVIRONMENTAL

280-58523 Chain of Custody

TAL-4124-280 (0508)

Client	Project Manager	Date	Chain of Custody Number
SCF	DOUG HALOON	7/28/14	190610
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 3**
1006 FLOYD CULLER CT	(865) 481-7837		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
OAK RIDGE / TN / 37830			
Project Name and Location (State) ALASKA	**Carrier/Waybill Number**		
AF MULTI BASE INVESTIGATION - EIELSON AFB			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: PFC	Special Instructions/ Conditions of Receipt
EAFB03-SB-001-001	7/29/14	0930				X	1						X	
EAFB03-SB-004-010	7/28/14	1152				X	1							
EAFB03-SB-003-009	7/28/14	1219				X	1							
EAFB03-SB-002-~~009~~ 010 LTM	7/28/14	1242				X	1							EAFB03-SB-002-~~10~~ 010
EAFB02-SB-001-001	7/28/14	1410				X	1							
EAFB02-SB-001-008	7/28/14	1420				X	1							
EAFB02-SB-002-001	7/29/14	1115				X	1							
EAFB02-SB-002-005		1120				X	1							
EAFB02-SB-003-003		1215				X	1							
EAFB01-SB-003-001		1340				X	1							
EAFB01-SB-003-006		1345				X	1							
EAFB01-SB-001-001	7/29/14	1420				X	2						X	+MS/MSD

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Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STANDARD

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
[signature]	7/31/14	0900	[signature]	~~7/5~~ 04/Aug/14	0955
2. Relinquished By	Date	Time	2. Received By	Date	Time
					8/5/14
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

COOLER 1 of 2 (SOIL)

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-260 (0508)

Client	Project Manager	Date	Chain of Custody Number
SCF	DOUG HAWN	7/29/14	190609
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 2 of 3**
1006 FLOYD CULLER CT	(865) 481-7837		
City	**State**	**Zip Code**	**Site Contact** / **Lab Contact**
OAK RIDGE	TN	37830	
Project Name and Location (State)	**Carrier/Waybill Number**		
AF MULTI BASE INVESTIGATION			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	Analysis: DEC	Special Instructions/ Conditions of Receipt
EAFB01-SB-001-901	7/29/14	1422				X	1						X	
EAFB01-SB-001-002		1425				X	2						X	+MS/MSD
EAFB01-SB-001-902		1430				X	1						X	
EAFB03-SB-001-010		0920				X	1						X	EAFB03-SB-001-010
EAFB01-SB-002-001		1525				X	1						X	
EAFB01-SB-002-003		1530				X	1						X	
EAFB04-SB-001-004	↓	1730				X	1						X	
EAFB04-SB-001-001	7/29/14	1805				X	1						X	
EAFB04-SB-003-002	7/29/14	1650				X	1						X	
EAFB04-SB-002-001	7/30/14	1245				X	1						X	
EAFB04-SB-002-003	7/30/14	1250				X	1						X	
EAFB04-SB-004-005	7/30/14	1345				X	1						X	

Page 6 of 6

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STANDARD

QC Requirements (Specify)

	Date	Time
1. Relinquished By: Melissa McNeil	7/31/14	0900
2. Relinquished By		
3. Relinquished By		

	Date	Time
1. Received By	04Aug14	~~1615~~ 0955
2. Received By		
3. Received By		

Comments

COOLER 1 of 2 (SOIL)

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client: SCF	Project Manager: Doug Hawn	Date: 7/30/14	Chain of Custody Number: 190624
Address: 1006 Floyd Culler Ct	Telephone Number (Area Code)/Fax Number: (865) 481-7837	Lab Number	Page 3 of 3
City: Oak Ridge / State: TN / Zip Code: 37830	Site Contact	Lab Contact	
Project Name and Location (State): AF Multi Base Investigation - Elelson	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	PFC	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
EAFB03-SD-001-D01	7/30/14	1520			X		2						X		+ MS/MSD
EAFB03-SD-001-901	7/30/14	1525			X		1						X		

Page 671 of 672

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STANDARD

QC Requirements (Specify)

1. Relinquished By: Nathan Mitchell	Date: 7/31/14	Time: 0900	1. Received By	Date: 04 Aug 14	Time: 0955
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments: Cooler 1 of 2 (SOIL)

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-001-001

Lab Sample ID: 280-58523-1
Client Matrix: Solid

% Moisture: 14.6

Date Sampled: 07/29/2014 0930
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14020.d
Dilution:	1.0			Initial Weight/Volume:	10.13 g
Analysis Date:	08/14/2014 1822			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Re-Qual
Perfluorobutane Sulfonate (PFBS)	0.71	J	0.16	0.93	
Perfluorobutanoic acid (PFBA)	0.69	U	0.14	0.93	
Perfluorodecane sulfonate (PFDS)	10	M	0.35	0.93	
Perfluorodecanoic acid (PFDA)	0.59	J	0.31	0.93	
Perfluorododecanoic acid (PFDoA)	0.69	U	0.66	2.3	
Perfluoroheptanoic acid (PFHpA)	0.72	J	0.14	0.93	
Perfluorohexane Sulfonate (PFHxS)	11		0.32	0.93	
Perfluorohexanoic acid (PFHxA)	2.2		0.17	0.93	
Perfluorononanoic acid (PFNA)	23		0.25	0.93	J 10a
Perfluorooctane Sulfonamide (FOSA)	3.2		0.11	0.93	
Perfluorooctanoic acid (PFOA)	6.0		0.27	0.93	
Perfluoropentanoic acid (PFPA)	0.84	J	0.28	0.93	
Perfluorotetradecanoic acid (PFTeA)	1.6	U	0.80	2.3	
Perfluorotridecanoic Acid (PFTriA)	0.69	U	0.37	0.93	
Perfluoroundecanoic acid (PFUnA)	0.69	U	0.37	0.93	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	103		57 - 153
13C8 PFOS	126		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-001-001

Lab Sample ID: 280-58523-1
Client Matrix: Solid

% Moisture: 14.6

Date Sampled: 07/29/2014 0930
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14046.d
Dilution:	1.0			Initial Weight/Volume:	10.13 g
Analysis Date:	08/14/2014 2342	Run Type:	DL	Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctane Sulfonate (PFOS)		5700		0.16	0.93

Rev Qual J 10a

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	102	D	57 - 153
13C8 PFOS	86	D	70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-004-010

Lab Sample ID: 280-58523-2
Client Matrix: Solid

% Moisture: 16.1

Date Sampled: 07/28/2014 1152
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14021.d
Dilution:	1.0			Initial Weight/Volume:	10.18 g
Analysis Date:	08/14/2014 1835			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		72		0.16	0.94	
Perfluorobutanoic acid (PFBA)		14		0.14	0.94	
Perfluorodecane sulfonate (PFDS)		18	M	0.35	0.94	
Perfluorodecanoic acid (PFDA)		0.42	J	0.32	0.94	J
Perfluorododecanoic acid (PFDoA)		0.70	U	0.67	2.3	U
Perfluoroheptanoic acid (PFHpA)		6.8		0.14	0.94	
Perfluorohexane Sulfonate (PFHxS)		130		0.33	0.94	
Perfluorohexanoic acid (PFHxA)		140		0.18	0.94	
Perfluorononanoic acid (PFNA)		0.70	U	0.26	0.94	UJ 10a
Perfluorooctane Sulfonamide (FOSA)		150		0.11	0.94	
Perfluorooctanoic acid (PFOA)		130		0.27	0.94	
Perfluoropentanoic acid (PFPA)		50		0.28	0.94	
Perfluorotetradecanoic acid (PFTeA)		1.6	U	0.81	2.3	U
Perfluorotridecanoic Acid (PFTriA)		0.70	U	0.37	0.94	↓
Perfluoroundecanoic acid (PFUnA)		0.70	U	0.37	0.94	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		57 - 153
13C8 PFOS	113		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-004-010

Lab Sample ID: 280-58523-2
Client Matrix: Solid % Moisture: 16.1

Date Sampled: 07/28/2014 1152
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14047.d
Dilution:	1.0			Initial Weight/Volume:	10.18 g
Analysis Date:	08/14/2014 2355	Run Type:	DL	Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctane Sulfonate (PFOS)		1400		0.16	0.94

Rev Qual J 10a

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106	D	57 - 153
13C8 PFOS	89	D	70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-003-009

Lab Sample ID: 280-58523-3
Client Matrix: Solid

% Moisture: 3.9

Date Sampled: 07/28/2014 1219
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14022.d
Dilution:	1.0			Initial Weight/Volume:	10.15 g
Analysis Date:	08/14/2014 1847			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	4.2		0.14	0.82	
Perfluorobutanoic acid (PFBA)	0.96		0.12	0.82	
Perfluorodecane sulfonate (PFDS)	0.62	U	0.31	0.82	U
Perfluorodecanoic acid (PFDA)	0.62	U	0.28	0.82	↓
Perfluorododecanoic acid (PFDoA)	0.62	U	0.58	2.1	
Perfluoroheptanoic acid (PFHpA)	1.4		0.12	0.82	
Perfluorohexane Sulfonate (PFHxS)	41		0.29	0.82	
Perfluorohexanoic acid (PFHxA)	30		0.15	0.82	
Perfluorononanoic acid (PFNA)	0.62	U	0.23	0.82	U
Perfluorooctane Sulfonamide (FOSA)	0.62	U	0.10	0.82	U
Perfluorooctane Sulfonate (PFOS)	0.76	J	0.14	0.82	J
Perfluorooctanoic acid (PFOA)	49		0.24	0.82	
Perfluoropentanoic acid (PFPA)	2.8		0.25	0.82	
Perfluorotetradecanoic acid (PFTeA)	1.4	U	0.71	2.1	U
Perfluorotridecanoic Acid (PFTriA)	0.62	U	0.33	0.82	
Perfluoroundecanoic acid (PFUnA)	0.62	U	0.33	0.82	↓

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		57 - 153
13C8 PFOS	105		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-002-010

Lab Sample ID: 280-58523-4
Client Matrix: Solid % Moisture: 6.3

Date Sampled: 07/28/2014 1242
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14023.d
Dilution:	1.0			Initial Weight/Volume:	10.57 g
Analysis Date:	08/14/2014 1859			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		23		0.14	0.81	
Perfluorobutanoic acid (PFBA)		7.8		0.12	0.81	
Perfluorodecane sulfonate (PFDS)		0.61	U	0.30	0.81	U
Perfluorodecanoic acid (PFDA)		0.61	U	0.27	0.81	↓
Perfluorododecanoic acid (PFDoA)		0.61	U	0.58	2.0	
Perfluoroheptanoic acid (PFHpA)		4.0		0.12	0.81	
Perfluorohexane Sulfonate (PFHxS)		31		0.28	0.81	
Perfluorohexanoic acid (PFHxA)		53		0.15	0.81	
Perfluorononanoic acid (PFNA)		0.61	U	0.22	0.81	U
Perfluorooctane Sulfonamide (FOSA)		0.20	J	0.099	0.81	J
Perfluorooctane Sulfonate (PFOS)		13		0.14	0.81	
Perfluorooctanoic acid (PFOA)		16		0.23	0.81	
Perfluoropentanoic acid (PFPA)		18		0.24	0.81	
Perfluorotetradecanoic acid (PFTeA)		1.4	U	0.70	2.0	U
Perfluorotridecanoic Acid (PFTriA)		0.61	U	0.32	0.81	↓
Perfluoroundecanoic acid (PFUnA)		0.61	U	0.32	0.81	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	101		57 - 153
13C8 PFOS	107		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB02-SB-001-001

Lab Sample ID: 280-58523-5
Client Matrix: Solid
% Moisture: 13.9

Date Sampled: 07/28/2014 1410
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14024.d
Dilution:	1.0			Initial Weight/Volume:	10.88 g
Analysis Date:	08/14/2014 1912			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev 2nd
Perfluorobutane Sulfonate (PFBS)	0.64	U	0.15	0.85	u
Perfluorobutanoic acid (PFBA)	0.64	U	0.13	0.85	u
Perfluorodecane sulfonate (PFDS)	0.75	J	0.32	0.85	J
Perfluorodecanoic acid (PFDA)	0.64	U	0.29	0.85	u
Perfluorododecanoic acid (PFDoA)	0.64	U	0.61	2.1	
Perfluoroheptanoic acid (PFHpA)	0.64	U	0.13	0.85	
Perfluorohexane Sulfonate (PFHxS)	0.43	J	0.30	0.85	J
Perfluorohexanoic acid (PFHxA)	0.64	U	0.16	0.85	u
Perfluorononanoic acid (PFNA)	0.64	U	0.23	0.85	u
Perfluorooctane Sulfonamide (FOSA)	4.9		0.10	0.85	
Perfluorooctane Sulfonate (PFOS)	2.3		0.15	0.85	
Perfluorooctanoic acid (PFOA)	0.64	U	0.25	0.85	u
Perfluoropentanoic acid (PFPA)	0.64	U	0.26	0.85	
Perfluorotetradecanoic acid (PFTeA)	1.5	U	0.74	2.1	
Perfluorotridecanoic Acid (PFTriA)	0.64	U	0.34	0.85	
Perfluoroundecanoic acid (PFUnA)	0.64	U	0.34	0.85	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		57 - 153
13C8 PFOS	101		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB02-SB-001-008

Lab Sample ID: 280-58523-6
Client Matrix: Solid

% Moisture: 17.0

Date Sampled: 07/28/2014 1420
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14025.d
Dilution:	1.0			Initial Weight/Volume:	10.20 g
Analysis Date:	08/14/2014 1924			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.71	U	0.17	0.95	U
Perfluorobutanoic acid (PFBA)	0.71	U	0.14	0.95	
Perfluorodecane sulfonate (PFDS)	0.71	U	0.35	0.95	
Perfluorodecanoic acid (PFDA)	0.71	U	0.32	0.95	
Perfluorododecanoic acid (PFDoA)	0.71	U	0.67	2.4	
Perfluoroheptanoic acid (PFHpA)	0.71	U	0.14	0.95	
Perfluorohexane Sulfonate (PFHxS)	0.65	J	0.33	0.95	J
Perfluorohexanoic acid (PFHxA)	0.21	J	0.18	0.95	J
Perfluorononanoic acid (PFNA)	0.71	U	0.26	0.95	J
Perfluorooctane Sulfonamide (FOSA)	0.34	J	0.12	0.95	J
Perfluorooctane Sulfonate (PFOS)	14		0.17	0.95	
Perfluorooctanoic acid (PFOA)	0.71	U	0.27	0.95	U
Perfluoropentanoic acid (PFPA)	0.36	J	0.28	0.95	U
Perfluorotetradecanoic acid (PFTeA)	1.7	U	0.82	2.4	U
Perfluorotridecanoic Acid (PFTriA)	0.71	U	0.38	0.95	
Perfluoroundecanoic acid (PFUnA)	0.71	U	0.38	0.95	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		57 - 153
13C8 PFOS	106		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB02-SB-002-001

Lab Sample ID: 280-58523-7
Client Matrix: Solid

% Moisture: 24.6

Date Sampled: 07/29/2014 1115
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14026.d
Dilution:	1.0			Initial Weight/Volume:	10.93 g
Analysis Date:	08/14/2014 1936			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.73	U	0.17	0.97	u
Perfluorobutanoic acid (PFBA)		0.73	U	0.15	0.97	
Perfluorodecane sulfonate (PFDS)		0.73	U	0.36	0.97	
Perfluorodecanoic acid (PFDA)		0.73	U	0.33	0.97	
Perfluorododecanoic acid (PFDoA)		0.73	U	0.69	2.4	
Perfluoroheptanoic acid (PFHpA)		0.73	U	0.15	0.97	
Perfluorohexane Sulfonate (PFHxS)		1.6		0.34	0.97	
Perfluorohexanoic acid (PFHxA)		0.73	U	0.18	0.97	u
Perfluorononanoic acid (PFNA)		4.1		0.27	0.97	
Perfluorooctane Sulfonamide (FOSA)		0.73	U	0.12	0.97	u
Perfluorooctane Sulfonate (PFOS)		140		0.17	0.97	
Perfluorooctanoic acid (PFOA)		2.5		0.28	0.97	
Perfluoropentanoic acid (PFPA)		0.73	U	0.29	0.97	u
Perfluorotetradecanoic acid (PFTeA)		1.7	U	0.84	2.4	
Perfluorotridecanoic Acid (PFTriA)		0.73	U	0.39	0.97	
Perfluoroundecanoic acid (PFUnA)		0.73	U	0.39	0.97	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	110		57 - 153
13C8 PFOS	110		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB02-SB-002-005

Lab Sample ID: 280-58523-8
Client Matrix: Solid

% Moisture: 5.7

Date Sampled: 07/29/2014 1120
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14027.d
Dilution:	1.0			Initial Weight/Volume:	10.13 g
Analysis Date:	08/14/2014 1949			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.63	U	0.15	0.84	u
Perfluorobutanoic acid (PFBA)		0.63	U	0.13	0.84	
Perfluorodecane sulfonate (PFDS)		0.63	U	0.31	0.84	
Perfluorodecanoic acid (PFDA)		0.63	U	0.28	0.84	
Perfluorododecanoic acid (PFDoA)		0.63	U	0.60	2.1	
Perfluoroheptanoic acid (PFHpA)		0.63	U	0.13	0.84	u
Perfluorohexane Sulfonate (PFHxS)		1.0		0.29	0.84	
Perfluorohexanoic acid (PFHxA)		0.63	U	0.16	0.84	u
Perfluorononanoic acid (PFNA)		1.0		0.23	0.84	
Perfluorooctane Sulfonamide (FOSA)		0.63	U	0.10	0.84	u
Perfluorooctane Sulfonate (PFOS)		120	M	0.15	0.84	
Perfluorooctanoic acid (PFOA)		0.69	J	0.24	0.84	J u
Perfluoropentanoic acid (PFPA)		0.63	U	0.25	0.84	
Perfluorotetradecanoic acid (PFTeA)		1.5	U	0.72	2.1	
Perfluorotridecanoic Acid (PFTriA)		0.63	U	0.33	0.84	
Perfluoroundecanoic acid (PFUnA)		0.63	U	0.33	0.84	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		57 - 153
13C8 PFOS	110		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB02-SB-003-003

Lab Sample ID: 280-58523-9
Client Matrix: Solid

% Moisture: 23.3

Date Sampled: 07/29/2014 1215
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14029.d
Dilution:	1.0			Initial Weight/Volume:	10.83 g
Analysis Date:	08/14/2014 2013			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.72	U	0.17	0.96	U
Perfluorobutanoic acid (PFBA)		1.1		0.14	0.96	
Perfluorodecane sulfonate (PFDS)		0.45	J	0.36	0.96	J
Perfluorodecanoic acid (PFDA)		2.6		0.33	0.96	
Perfluorododecanoic acid (PFDoA)		0.72	U	0.69	2.4	U
Perfluoroheptanoic acid (PFHpA)		1.4		0.14	0.96	
Perfluorohexane Sulfonate (PFHxS)		1.2		0.34	0.96	
Perfluorohexanoic acid (PFHxA)		2.3		0.18	0.96	
Perfluorononanoic acid (PFNA)		1.5		0.26	0.96	
Perfluorooctane Sulfonamide (FOSA)		0.12	J M	0.12	0.96	J
Perfluorooctane Sulfonate (PFOS)		30		0.17	0.96	
Perfluorooctanoic acid (PFOA)		5.7		0.28	0.96	
Perfluoropentanoic acid (PFPA)		3.0		0.29	0.96	
Perfluorotetradecanoic acid (PFTeA)		1.7	U	0.83	2.4	U
Perfluorotridecanoic Acid (PFTriA)		0.72	U	0.39	0.96	
Perfluoroundecanoic acid (PFUnA)		0.72	U	0.39	0.96	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	111		57 - 153
13C8 PFOS	111		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-003-001

Lab Sample ID: 280-58523-10
Client Matrix: Solid

% Moisture: 17.6

Date Sampled: 07/29/2014 1340
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14030.d
Dilution:	1.0			Initial Weight/Volume:	10.57 g
Analysis Date:	08/14/2014 2025			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.69	U	0.16	0.92	U
Perfluorobutanoic acid (PFBA)		0.69	U	0.14	0.92	U
Perfluorodecane sulfonate (PFDS)		0.61	J	0.34	0.92	J
Perfluorodecanoic acid (PFDA)		0.69	U	0.31	0.92	U
Perfluorododecanoic acid (PFDoA)		0.69	U	0.65	2.3	U
Perfluoroheptanoic acid (PFHpA)		0.14	J	0.14	0.92	J
Perfluorohexane Sulfonate (PFHxS)		8.4		0.32	0.92	
Perfluorohexanoic acid (PFHxA)		0.30	J	0.17	0.92	J
Perfluorononanoic acid (PFNA)		1.3		0.25	0.92	
Perfluorooctane Sulfonamide (FOSA)		1.0		0.11	0.92	
Perfluorooctane Sulfonate (PFOS)		99		0.16	0.92	
Perfluorooctanoic acid (PFOA)		2.6		0.26	0.92	
Perfluoropentanoic acid (PFPA)		0.69	U	0.28	0.92	U
Perfluorotetradecanoic acid (PFTeA)		1.6	U	0.79	2.3	U
Perfluorotridecanoic Acid (PFTriA)		0.69	U	0.37	0.92	U
Perfluoroundecanoic acid (PFUnA)		0.69	U	0.37	0.92	U

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	108		57 - 153
13C8 PFOS	111		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-003-006

Lab Sample ID: 280-58523-11
Client Matrix: Solid

% Moisture: 31.8

Date Sampled: 07/29/2014 1345
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14031.d
Dilution:	1.0			Initial Weight/Volume:	10.65 g
Analysis Date:	08/14/2014 2038			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	RevQual
Perfluorobutane Sulfonate (PFBS)		0.86	J	0.19	1.1	
Perfluorobutanoic acid (PFBA)		0.83	U	0.17	1.1	
Perfluorodecane sulfonate (PFDS)		0.83	U	0.41	1.1	
Perfluorodecanoic acid (PFDA)		0.83	U	0.37	1.1	
Perfluorododecanoic acid (PFDoA)		0.83	U	0.78	2.8	
Perfluoroheptanoic acid (PFHpA)		0.83	U	0.17	1.1	
Perfluorohexane Sulfonate (PFHxS)		66		0.39	1.1	
Perfluorohexanoic acid (PFHxA)		1.4		0.21	1.1	
Perfluorononanoic acid (PFNA)		0.83	U	0.30	1.1	
Perfluorooctane Sulfonamide (FOSA)		0.83	U	0.13	1.1	
Perfluorooctane Sulfonate (PFOS)		0.38	J	0.19	1.1	
Perfluorooctanoic acid (PFOA)		1.0	J	0.32	1.1	
Perfluoropentanoic acid (PFPA)		0.65	J M	0.33	1.1	
Perfluorotetradecanoic acid (PFTeA)		1.9	U	0.95	2.8	
Perfluorotridecanoic Acid (PFTriA)		0.83	U	0.44	1.1	
Perfluoroundecanoic acid (PFUnA)		0.83	U	0.44	1.1	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104		57 - 153
13C8 PFOS	114		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-001-001

Lab Sample ID: 280-58523-12
Client Matrix: Solid % Moisture: 32.7

Date Sampled: 07/29/2014 1420
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14032.d
Dilution:	1.0			Initial Weight/Volume:	10.65 g
Analysis Date:	08/14/2014 2050			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.84	U	0.20	1.1	U
Perfluorobutanoic acid (PFBA)	0.84	U	0.17	1.1	
Perfluorodecane sulfonate (PFDS)	0.84	U	0.42	1.1	
Perfluorodecanoic acid (PFDA)	0.84	U	0.38	1.1	
Perfluorododecanoic acid (PFDoA)	0.84	U	0.80	2.8	
Perfluoroheptanoic acid (PFHpA)	0.84	U	0.17	1.1	
Perfluorohexane Sulfonate (PFHxS)	0.84	U	0.39	1.1	
Perfluorohexanoic acid (PFHxA)	0.84	U	0.21	1.1	
Perfluorononanoic acid (PFNA)	0.84	U	0.31	1.1	
Perfluorooctane Sulfonamide (FOSA)	0.84	U	0.14	1.1	
Perfluorooctane Sulfonate (PFOS)	0.80	J	0.20	1.1	J
Perfluorooctanoic acid (PFOA)	0.84	U	0.32	1.1	
Perfluoropentanoic acid (PFPA)	0.84	U	0.33	1.1	
Perfluorotetradecanoic acid (PFTeA)	2.0	U	0.96	2.8	
Perfluorotridecanoic Acid (PFTriA)	0.84	U	0.45	1.1	
Perfluoroundecanoic acid (PFUnA)	0.84	U	0.45	1.1	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	103		57 - 153
13C8 PFOS	109		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-001-901

Lab Sample ID: 280-58523-13
Client Matrix: Solid

% Moisture: 17.4

Date Sampled: 07/29/2014 1422
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14035.d
Dilution:	1.0			Initial Weight/Volume:	10.51 g
Analysis Date:	08/14/2014 2127			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.69	U	0.16	0.92	U
Perfluorobutanoic acid (PFBA)		0.69	U	0.14	0.92	
Perfluorodecane sulfonate (PFDS)		0.69	U	0.35	0.92	
Perfluorodecanoic acid (PFDA)		0.69	U	0.31	0.92	
Perfluorododecanoic acid (PFDoA)		0.69	U	0.66	2.3	
Perfluoroheptanoic acid (PFHpA)		0.69	U	0.14	0.92	
Perfluorohexane Sulfonate (PFHxS)		0.69	U	0.32	0.92	
Perfluorohexanoic acid (PFHxA)		0.69	U	0.17	0.92	
Perfluorononanoic acid (PFNA)		0.69	U	0.25	0.92	
Perfluorooctane Sulfonamide (FOSA)		0.69	U	0.11	0.92	
Perfluorooctane Sulfonate (PFOS)		0.40	J	0.16	0.92	J
Perfluorooctanoic acid (PFOA)		0.69	U	0.27	0.92	U
Perfluoropentanoic acid (PFPA)		0.69	U	0.28	0.92	
Perfluorotetradecanoic acid (PFTeA)		1.6	U	0.80	2.3	
Perfluorotridecanoic Acid (PFTriA)		0.69	U	0.37	0.92	
Perfluoroundecanoic acid (PFUnA)		0.69	U	0.37	0.92	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		57 - 153
13C8 PFOS	105		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-001-002

Lab Sample ID: 280-58523-14
Client Matrix: Solid

% Moisture: 23.3

Date Sampled: 07/29/2014 1425
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14036.d
Dilution:	1.0			Initial Weight/Volume:	10.50 g
Analysis Date:	08/14/2014 2139			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	0.74	U	0.17	0.99
Perfluorobutanoic acid (PFBA)	0.74	U	0.15	0.99
Perfluorodecane sulfonate (PFDS)	0.74	U	0.37	0.99
Perfluorodecanoic acid (PFDA)	0.74	U	0.34	0.99
Perfluorododecanoic acid (PFDoA)	0.74	U	0.71	2.5
Perfluoroheptanoic acid (PFHpA)	0.74	U	0.15	0.99
Perfluorohexane Sulfonate (PFHxS)	0.74	U	0.35	0.99
Perfluorohexanoic acid (PFHxA)	0.74	U	0.19	0.99
Perfluorononanoic acid (PFNA)	0.74	U	0.27	0.99
Perfluorooctane Sulfonamide (FOSA)	0.74	U	0.12	0.99
Perfluorooctane Sulfonate (PFOS)	0.74	U	0.17	0.99
Perfluorooctanoic acid (PFOA)	0.74	U	0.29	0.99
Perfluoropentanoic acid (PFPA)	0.74	U	0.30	0.99
Perfluorotetradecanoic acid (PFTeA)	1.7	U J	0.86	2.5
Perfluorotridecanoic Acid (PFTriA)	0.74	U J	0.40	0.99
Perfluoroundecanoic acid (PFUnA)	0.74	U	0.40	0.99

Rev Qual
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Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		57 - 153
13C8 PFOS	122		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-001-902

Lab Sample ID: 280-58523-15
Client Matrix: Solid

% Moisture: 26.2

Date Sampled: 07/29/2014 1430
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14040.d
Dilution:	1.0			Initial Weight/Volume:	10.04 g
Analysis Date:	08/14/2014 2229			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)		0.81	U	0.19	1.1
Perfluorobutanoic acid (PFBA)		0.81	U	0.16	1.1
Perfluorodecane sulfonate (PFDS)		0.81	U	0.40	1.1
Perfluorodecanoic acid (PFDA)		0.81	U	0.36	1.1
Perfluorododecanoic acid (PFDoA)		0.81	U	0.77	2.7
Perfluoroheptanoic acid (PFHpA)		0.81	U	0.16	1.1
Perfluorohexane Sulfonate (PFHxS)		0.81	U M	0.38	1.1
Perfluorohexanoic acid (PFHxA)		0.81	U	0.20	1.1
Perfluorononanoic acid (PFNA)		0.81	U	0.30	1.1
Perfluorooctane Sulfonamide (FOSA)		0.81	U	0.13	1.1
Perfluorooctane Sulfonate (PFOS)		0.81	U	0.19	1.1
Perfluorooctanoic acid (PFOA)		0.81	U	0.31	1.1
Perfluoropentanoic acid (PFPA)		0.81	U	0.32	1.1
Perfluorotetradecanoic acid (PFTeA)		1.9	U	0.93	2.7
Perfluorotridecanoic Acid (PFTriA)		0.81	U	0.43	1.1
Perfluoroundecanoic acid (PFUnA)		0.81	U	0.43	1.1

Red Qual

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	107		57 - 153
13C8 PFOS	110		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SB-001-010

Lab Sample ID: 280-58523-16
Client Matrix: Solid

% Moisture: 5.3

Date Sampled: 07/29/2014 0920
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14041.d
Dilution:	1.0			Initial Weight/Volume:	10.49 g
Analysis Date:	08/14/2014 2241			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		17		0.14	0.81	
Perfluorobutanoic acid (PFBA)		3.0		0.12	0.81	
Perfluorodecane sulfonate (PFDS)		0.60	U	0.30	0.81	u
Perfluorodecanoic acid (PFDA)		0.60	U	0.27	0.81	↓
Perfluorododecanoic acid (PFDoA)		0.60	U	0.57	2.0	
Perfluoroheptanoic acid (PFHpA)		1.9		0.12	0.81	
Perfluorohexane Sulfonate (PFHxS)		66		0.28	0.81	
Perfluorohexanoic acid (PFHxA)		29		0.15	0.81	
Perfluorononanoic acid (PFNA)		0.60	U	0.22	0.81	u
Perfluorooctane Sulfonamide (FOSA)		0.60	U	0.099	0.81	u
Perfluorooctane Sulfonate (PFOS)		14		0.14	0.81	
Perfluorooctanoic acid (PFOA)		140		0.23	0.81	
Perfluoropentanoic acid (PFPA)		10		0.24	0.81	
Perfluorotetradecanoic acid (PFTeA)		1.4	U	0.69	2.0	u
Perfluorotridecanoic Acid (PFTriA)		0.60	U	0.32	0.81	↓
Perfluoroundecanoic acid (PFUnA)		0.60	U	0.32	0.81	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	103		57 - 153
13C8 PFOS	109		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-002-001

Lab Sample ID: 280-58523-17
Client Matrix: Solid % Moisture: 24.7

Date Sampled: 07/29/2014 1525
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14042.d
Dilution:	1.0			Initial Weight/Volume:	10.21 g
Analysis Date:	08/14/2014 2253			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.78	U	0.18	1.0	u
Perfluorobutanoic acid (PFBA)		0.78	U	0.16	1.0	
Perfluorodecane sulfonate (PFDS)		0.78	U	0.39	1.0	
Perfluorodecanoic acid (PFDA)		0.78	U	0.35	1.0	
Perfluorododecanoic acid (PFDoA)		0.78	U	0.74	2.6	
Perfluoroheptanoic acid (PFHpA)		0.78	U	0.16	1.0	
Perfluorohexane Sulfonate (PFHxS)		0.78	U	0.36	1.0	
Perfluorohexanoic acid (PFHxA)		0.78	U	0.20	1.0	
Perfluorononanoic acid (PFNA)		0.78	U	0.29	1.0	
Perfluorooctane Sulfonamide (FOSA)		0.78	U	0.13	1.0	u
Perfluorooctane Sulfonate (PFOS)		3.7		0.18	1.0	
Perfluorooctanoic acid (PFOA)		0.78	U	0.30	1.0	u
Perfluoropentanoic acid (PFPA)		0.78	U	0.31	1.0	
Perfluorotetradecanoic acid (PFTeA)		1.8	U	0.90	2.6	
Perfluorotridecanoic Acid (PFTriA)		0.78	U	0.42	1.0	
Perfluoroundecanoic acid (PFUnA)		0.78	U	0.42	1.0	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	109		57 - 153
13C8 PFOS	111		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB01-SB-002-003

Lab Sample ID: 280-58523-18
Client Matrix: Solid

% Moisture: 18.7

Date Sampled: 07/29/2014 1530
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14043.d
Dilution:	1.0			Initial Weight/Volume:	10.09 g
Analysis Date:	08/14/2014 2306			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)		0.73	U	0.17	0.98
Perfluorobutanoic acid (PFBA)		0.73	U	0.15	0.98
Perfluorodecane sulfonate (PFDS)		0.73	U	0.37	0.98
Perfluorodecanoic acid (PFDA)		0.73	U	0.33	0.98
Perfluorododecanoic acid (PFDoA)		0.73	U	0.69	2.4
Perfluoroheptanoic acid (PFHpA)		0.73	U	0.15	0.98
Perfluorohexane Sulfonate (PFHxS)		0.73	U	0.34	0.98
Perfluorohexanoic acid (PFHxA)		0.73	U	0.18	0.98
Perfluorononanoic acid (PFNA)		0.73	U	0.27	0.98
Perfluorooctane Sulfonamide (FOSA)		0.73	U	0.12	0.98
Perfluorooctane Sulfonate (PFOS)		10		0.17	0.98
Perfluorooctanoic acid (PFOA)		0.73	U	0.28	0.98
Perfluoropentanoic acid (PFPA)		0.73	U	0.29	0.98
Perfluorotetradecanoic acid (PFTeA)		1.7	U	0.84	2.4
Perfluorotridecanoic Acid (PFTriA)		0.73	U	0.39	0.98
Perfluoroundecanoic acid (PFUnA)		0.73	U	0.39	0.98

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	111		57 - 153
13C8 PFOS	107		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-SB-001-004**

Lab Sample ID: 280-58523-19
Client Matrix: Solid
% Moisture: 14.5

Date Sampled: 07/29/2014 1730
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14044.d
Dilution:	1.0			Initial Weight/Volume:	10.56 g
Analysis Date:	08/14/2014 2318			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorobutane Sulfonate (PFBS)	0.66	U	0.15	0.89
Perfluorobutanoic acid (PFBA)	0.66	U	0.13	0.89
Perfluorodecane sulfonate (PFDS)	0.66	U	0.33	0.89
Perfluorodecanoic acid (PFDA)	0.66	U	0.30	0.89
Perfluorododecanoic acid (PFDoA)	0.66	U	0.63	2.2
Perfluoroheptanoic acid (PFHpA)	0.66	U	0.13	0.89
Perfluorohexane Sulfonate (PFHxS)	0.66	U	0.31	0.89
Perfluorohexanoic acid (PFHxA)	0.66	U	0.17	0.89
Perfluorononanoic acid (PFNA)	0.66	U	0.24	0.89
Perfluorooctane Sulfonamide (FOSA)	0.66	U	0.11	0.89
Perfluorooctane Sulfonate (PFOS)	0.66	U	0.15	0.89
Perfluorooctanoic acid (PFOA)	0.66	U	0.25	0.89
Perfluoropentanoic acid (PFPA)	0.66	U	0.27	0.89
Perfluorotetradecanoic acid (PFTeA)	1.5	U	0.76	2.2
Perfluorotridecanoic Acid (PFTriA)	0.66	U	0.35	0.89
Perfluoroundecanoic acid (PFUnA)	0.66	U	0.35	0.89

Rev Qual

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		57 - 153
13C8 PFOS	107		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB04-SB-001-001

Lab Sample ID: 280-58523-20
Client Matrix: Solid

% Moisture: 12.5

Date Sampled: 07/29/2014 1805
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239003	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237985	Lab File ID:	PC514H14045.d
Dilution:	1.0			Initial Weight/Volume:	10.59 g
Analysis Date:	08/14/2014 2330			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	RW Qual
Perfluorobutane Sulfonate (PFBS)		0.65	U	0.15	0.86	U
Perfluorobutanoic acid (PFBA)		0.65	U	0.13	0.86	
Perfluorodecane sulfonate (PFDS)		0.65	U	0.32	0.86	
Perfluorodecanoic acid (PFDA)		0.65	U	0.29	0.86	
Perfluorododecanoic acid (PFDoA)		0.65	U	0.62	2.2	
Perfluoroheptanoic acid (PFHpA)		0.65	U	0.13	0.86	
Perfluorohexane Sulfonate (PFHxS)		0.65	U	0.30	0.86	
Perfluorohexanoic acid (PFHxA)		0.65	U	0.16	0.86	
Perfluorononanoic acid (PFNA)		0.65	U	0.24	0.86	
Perfluorooctane Sulfonamide (FOSA)		0.65	U	0.11	0.86	U
Perfluorooctane Sulfonate (PFOS)		0.78	J	0.15	0.86	J
Perfluorooctanoic acid (PFOA)		0.65	U	0.25	0.86	U
Perfluoropentanoic acid (PFPA)		0.65	U	0.26	0.86	
Perfluorotetradecanoic acid (PFTeA)		1.5	U	0.74	2.2	
Perfluorotridecanoic Acid (PFTriA)		0.65	U	0.35	0.86	
Perfluoroundecanoic acid (PFUnA)		0.65	U	0.35	0.86	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104		57 - 153
13C8 PFOS	113		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB04-SB-003-002

Lab Sample ID: 280-58523-21
Client Matrix: Solid

% Moisture: 23.0

Date Sampled: 07/29/2014 1650
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239004	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237986	Lab File ID:	PC514H14051.d
Dilution:	1.0			Initial Weight/Volume:	10.25 g
Analysis Date:	08/15/2014 0044			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.76	U	0.18	1.0	U
Perfluorobutanoic acid (PFBA)	0.76	U	0.15	1.0	
Perfluorodecane sulfonate (PFDS)	0.76	U	0.38	1.0	
Perfluorodecanoic acid (PFDA)	0.76	U	0.34	1.0	
Perfluorododecanoic acid (PFDoA)	0.76	U	0.72	2.5	
Perfluoroheptanoic acid (PFHpA)	0.76	U	0.15	1.0	
Perfluorohexane Sulfonate (PFHxS)	0.37	J	0.35	1.0	J
Perfluorohexanoic acid (PFHxA)	0.76	U	0.19	1.0	
Perfluorononanoic acid (PFNA)	0.76	U	0.28	1.0	
Perfluorooctane Sulfonamide (FOSA)	0.76	U	0.12	1.0	
Perfluorooctane Sulfonate (PFOS)	0.76	U	0.18	1.0	
Perfluorooctanoic acid (PFOA)	0.76	U	0.29	1.0	
Perfluoropentanoic acid (PFPA)	0.76	U	0.30	1.0	
Perfluorotetradecanoic acid (PFTeA)	1.8	U	0.87	2.5	
Perfluorotridecanoic Acid (PFTriA)	0.76	U	0.41	1.0	
Perfluoroundecanoic acid (PFUnA)	0.76	U	0.41	1.0	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		57 - 153
13C8 PFOS	115		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB04-SB-002-001

Lab Sample ID: 280-58523-22
Client Matrix: Solid % Moisture: 9.1

Date Sampled: 07/30/2014 1245
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239004	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237986	Lab File ID:	PC514H14052.d
Dilution:	1.0			Initial Weight/Volume:	10.69 g
Analysis Date:	08/15/2014 0056			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.62	U	0.14	0.82	u
Perfluorobutanoic acid (PFBA)	0.62	U	0.12	0.82	
Perfluorodecane sulfonate (PFDS)	0.62	U	0.31	0.82	
Perfluorodecanoic acid (PFDA)	0.62	U	0.28	0.82	
Perfluorododecanoic acid (PFDoA)	0.62	U	0.59	2.1	
Perfluoroheptanoic acid (PFHpA)	0.62	U	0.12	0.82	u
Perfluorohexane Sulfonate (PFHxS)	1.9		0.29	0.82	
Perfluorohexanoic acid (PFHxA)	0.62	U	0.15	0.82	u
Perfluorononanoic acid (PFNA)	1.5		0.23	0.82	
Perfluorooctane Sulfonamide (FOSA)	0.62	U	0.10	0.82	u
Perfluorooctane Sulfonate (PFOS)	15		0.14	0.82	
Perfluorooctanoic acid (PFOA)	2.8		0.24	0.82	
Perfluoropentanoic acid (PFPA)	0.62	U	0.25	0.82	u
Perfluorotetradecanoic acid (PFTeA)	1.4	U	0.71	2.1	
Perfluorotridecanoic Acid (PFTriA)	0.62	U	0.33	0.82	
Perfluoroundecanoic acid (PFUnA)	0.62	U	0.33	0.82	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	106		57 - 153
13C8 PFOS	113		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB04-SB-002-008

Lab Sample ID: 280-58523-23
Client Matrix: Solid % Moisture: 15.4

Date Sampled: 07/30/2014 1250
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239004	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237986	Lab File ID:	PC514H14053.d
Dilution:	1.0			Initial Weight/Volume:	10.16 g
Analysis Date:	08/15/2014 0109			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)		0.70	U	0.16	0.93	U
Perfluorobutanoic acid (PFBA)		0.70	U	0.14	0.93	
Perfluorodecane sulfonate (PFDS)		0.70	U	0.35	0.93	
Perfluorodecanoic acid (PFDA)		0.70	U	0.31	0.93	
Perfluorododecanoic acid (PFDoA)		0.70	U	0.66	2.3	U
Perfluoroheptanoic acid (PFHpA)		0.43	J	0.14	0.93	J
Perfluorohexane Sulfonate (PFHxS)		1.7		0.33	0.93	
Perfluorohexanoic acid (PFHxA)		0.70	U	0.17	0.93	U
Perfluorononanoic acid (PFNA)		0.70	U	0.26	0.93	
Perfluorooctane Sulfonamide (FOSA)		0.70	U	0.11	0.93	
Perfluorooctane Sulfonate (PFOS)		0.70	U	0.16	0.93	
Perfluorooctanoic acid (PFOA)		0.70	U	0.27	0.93	
Perfluoropentanoic acid (PFPA)		0.70	U	0.28	0.93	
Perfluorotetradecanoic acid (PFTeA)		1.6	U	0.80	2.3	
Perfluorotridecanoic Acid (PFTriA)		0.70	U	0.37	0.93	
Perfluoroundecanoic acid (PFUnA)		0.70	U	0.37	0.93	U

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		57 - 153
13C8 PFOS	107		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: **EAFB04-SB-004-005**

Lab Sample ID: 280-58523-24
Client Matrix: Solid

% Moisture: 4.5

Date Sampled: 07/30/2014 1345
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239004	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237986	Lab File ID:	PC514H14054.d
Dilution:	1.0			Initial Weight/Volume:	10.32 g
Analysis Date:	08/15/2014 0121			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	RW Qual
Perfluorobutane Sulfonate (PFBS)	0.61	U	0.14	0.81	U
Perfluorobutanoic acid (PFBA)	0.61	U	0.12	0.81	
Perfluorodecane sulfonate (PFDS)	0.61	U	0.30	0.81	
Perfluorodecanoic acid (PFDA)	0.61	U	0.27	0.81	
Perfluorododecanoic acid (PFDoA)	0.61	U	0.58	2.0	
Perfluoroheptanoic acid (PFHpA)	0.61	U	0.12	0.81	
Perfluorohexane Sulfonate (PFHxS)	0.61	U	0.28	0.81	
Perfluorohexanoic acid (PFHxA)	0.61	U	0.15	0.81	
Perfluorononanoic acid (PFNA)	0.50	J	0.22	0.81	J
Perfluorooctane Sulfonamide (FOSA)	0.61	U	0.099	0.81	U
Perfluorooctane Sulfonate (PFOS)	3.3		0.14	0.81	
Perfluorooctanoic acid (PFOA)	0.61	U	0.23	0.81	U
Perfluoropentanoic acid (PFPA)	0.61	U	0.24	0.81	
Perfluorotetradecanoic acid (PFTeA)	1.4	U	0.70	2.0	
Perfluorotridecanoic Acid (PFTriA)	0.61	U	0.32	0.81	
Perfluoroundecanoic acid (PFUnA)	0.61	U	0.32	0.81	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	109		57 - 153
13C8 PFOS	104		70 - 130

Client: SES Construction & Fuel Services, LLC

Job Number: 280-58523-1
Sdg Number: Eielson

Client Sample ID: EAFB03-SD-001-001

Lab Sample ID: 280-58523-25
Client Matrix: Solid
% Moisture: 18.3

Date Sampled: 07/30/2014 1520
Date Received: 08/04/2014 0955

DV-LC-0012 Perfluorinated Hydrocarbons

Analysis Method:	DV-LC-0012	Analysis Batch:	280-239004	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-237986	Lab File ID:	PC514H14055.d
Dilution:	1.0			Initial Weight/Volume:	10.57 g
Analysis Date:	08/15/2014 0133			Final Weight/Volume:	20 mL
Prep Date:	08/07/2014 1857			Injection Volume:	25 uL

Analyte (DryWt Corrected: Y)	Result (ug/Kg)	Qualifier	DL	LOQ	Rev Qual
Perfluorobutane Sulfonate (PFBS)	0.69	U	0.16	0.93	U
Perfluorobutanoic acid (PFBA)	0.69	U	0.14	0.93	
Perfluorodecane sulfonate (PFDS)	0.69	U	0.35	0.93	
Perfluorodecanoic acid (PFDA)	0.69	U	0.31	0.93	
Perfluorododecanoic acid (PFDoA)	0.69	U	0.66	2.3	
Perfluoroheptanoic acid (PFHpA)	0.69	U	0.14	0.93	
Perfluorohexane Sulfonate (PFHxS)	0.36	J	0.32	0.93	J
Perfluorohexanoic acid (PFHxA)	0.69	U	0.17	0.93	U
Perfluorononanoic acid (PFNA)	0.69	U	0.25	0.93	
Perfluorooctane Sulfonamide (FOSA)	0.69	U	0.11	0.93	
Perfluorooctane Sulfonate (PFOS)	2.7		0.16	0.93	
Perfluorooctanoic acid (PFOA)	0.69	U	0.27	0.93	U
Perfluoropentanoic acid (PFPA)	0.69	U	0.28	0.93	
Perfluorotetradecanoic acid (PFTeA)	1.6	U	0.80	2.3	
Perfluorotridecanoic Acid (PFTriA)	0.69	U	0.37	0.93	
Perfluoroundecanoic acid (PFUnA)	0.69	U	0.37	0.93	

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	105		57 - 153
13C8 PFOS	108		70 - 130

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

I. Technical Holding Times			
A. Sample Preservation, Handling and Transport			
1. Have all samples been preserved correctly?	Yes	No	N/A
2. Have sample temperatures been kept at 4° C (+ or - 2 °)?	Yes	No	N/A
3. Were all samples received in proper condition?	Yes	No	N/A
4. Were any qualifications required based on this information?	Yes	No	N/A
Coolers @ 0.5, 4.8 C			
B. Chain of Custody			
1. Were all samples properly recorded on COCs?	Yes	No	N/A
2. Were correct analyses performed on samples?	Yes	No	N/A
C. Holding Times			
1. Were samples extracted and analyzed within acceptable holding times?	Yes	No	N/A
2. Were any qualifications required based on this information?	Yes	No	N/A

	Sampled	*7 days*	*extraction*	*40 days*	*Analysis*	
Water						
Soil and sediment samples		*14 days*	*extraction*	*40 days*	*Analysis*	*Batch*
	7/28,7/29		**8/7**		**8/14**	**239003**
	7/29,7/30		**8/7**		**8/15**	**239004**

II. GC/MS Instrument Performance Check			
1. Were instrument performance check samples run for each analysis period?	Yes	No	N/A
2. Were ion abundance criteria met for BFB analysis?	Yes	No	N/A
3. Do laboratory forms match raw data?	Yes	No	N/A
4. Were any qualifications required based on this information?	Yes	No	N/A

Comments/Qualifications:

None

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

III.	Initial Calibration			
	1. Were correct numbers (5) and concentrations (5, 10, 50, 100, 200 ng/ul) of standards used for initial calibration standards to establish calibration curve?	Yes	No	N/A
	2. Were the RRFs greater than or equal to 0.050? RRF at greater than or equal to 0.010 for the poor response compounds.	Yes	No	N/A
	3. Were RRF RSDs within 30%: 40% for compounds exhibiting poor response?	Yes	No	N/A
	4. Were retention Times (RTs) within acceptable RT windows?	Yes	No	N/A

Comments/Qualifications:

ICV 8/14@15:42ff 280-239002/3ff—PFOA All RRFs are quadr. All R2 = >0.99

RRF			RSD			
1.336			0.33211	0.11029		
0.949			0.05489	0.00301		
1.014			0.01011	0.00010		
0.971			0.03289	0.00108		
1.046			0.04211	0.00177		
0.888			0.11589	0.01343		
1.067			0.06311	0.00398		
0.832			0.17189	0.02954		
		Mean				
0.932		RRF	0.07189	0.00516		
9.035	9	1.00388		0.16839	0.021049	
					0.15	
					14.5%	% RSD

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

IV. Continuing Calibration			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	Yes	No	N/A
2. Were the opening continuing calibration RRFs for semi-volatile organic compounds greater than or equal to 0.050? RRF at greater than or equal to 0.010 for the poor response compounds?	Yes	No	N/A
3. Was the closing continuing calibration RRFs for semi-volatile organic compounds greater than or equal 0.010 for all compounds?	Yes	No	N/A
4. Were %D between the initial calibration RRF and the opening continuing calibration RRFs within + or - 30%?	Yes	No	N/A
5 Were %D between the initial calibration RRF and the closing continuing calibration RRFs within + or - 30% for all responders?	Yes	No	N/A

EAFB03-SB-001-001 thru EAFB02-SB-002-005
CCV280-239003/24 8/14@20:01 %D<13% PFOS = 10.1-9.55/9.55 = 5.8%
EAFB02-SB-003-003 thru EAFB01-SB-001-002
CCV280-239003/35 8/14@22:16 %D<16% PFDoA = 5.00-4.97/5.00 = 0.6%
EAFB01-SB-001-902 thru EAFB03-SB-004-010DL
CCV 280-239003/44 8/15@00:07 %D<11% PFHxA = 10.0-9.48/10.0 = 5.2%
EAFB04-SB-003-002 thru EAFB03-SB-001-1

CCV 280-239003/44 8/15@00:07 %D<11% PFHxA = 10.0-9.48/10.0 = 5.2%
EAFB04-SB-003-002 thru EAFB03-SB-001-1
CCV 280-239003/54 8/15@02:10 %D<18% PFHxA = 5.00-4.56/5.00 = 8.8%

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

V.	**Blanks**			
	1. Were any target or non-target compounds reported in laboratory prep or calibration blanks?	**Yes**	No	**N/A**
	2. Were method blank analyses performed at required frequency, and for each GC/MS system used to analyze samples for each type of analysis (i.e., matrix)?	Yes	**No**	**N/A**
	3. Were any qualifications required based on this information? Based on the 5X rule or Table 6 in the guidelines: Blank <CRQL: sample <CRQL then U Blank >/=CRQL: sample <CRQL then U Blank >CRQL: sample >CRQL but <blank then U	**Yes**	No	**N/A**

Comments/Qualifications:

MB 280-237985/1-A 8/14@17:58 all non-detects
MB 280-237986/1-A 8/15@00:19 all non-detects

VI.	**System Monitoring Compounds (Surrogate Spikes)**			
	1. Were laboratory surrogate recoveries calculated and reported correctly?	Yes	**No**	**N/A**
	2. Were surrogate recoveries within acceptable limits?	Yes	**No**	**N/A**
	3. Were any qualifications required based on surrogate spike QC information?	**Yes**	No	**N/A**

Comments/Qualifications

surrogate	**13C8 PFOA**	**13C8 PFOS**
QC criteria	(57-153)	(70-130)
Range	**SB/SD**: 101-111%	86-126%

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

VII. Matrix Spikes/Matrix Spike Duplicates			
1. Were MS/MSD samples analyzed at required frequency for each ample matrix?	Yes	No	N/A
2. Were MS/MSD results for recovery and RPD within advisory limits?	Yes	No	N/A
3. Were Samples used for MS/MSD field blanks?	Yes	No	N/A
4. Were laboratory reported results correctly calculated from raw data?	Yes	No	N/A
5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information? parent sample only	Yes	No	N/A

Comments/Qualifications:

EAFB01-SB-001-001MS/MSD
8/14@21:02/21:15
MS = 72-108%
MSD = 74-109%
RPD's = 0-13%
PFDS MS = 29.8/27.5 = 108.4%
PFDS = 26.3/27.6 = 95.3%
PFDS-RPD = 12.5%

EAFB01-SB-001-002 MS/MSD
8/14@21:52/22:04
MS = 69-102%
MSD = 38.0-108% PFTeA/PFTriA-low R's MS okay-no quals
RPD's = 1-60%
PFDoA MS = 25.0/24.7 = 101.2%
PFDoA MSD = 24.6/24.3 = 101.2%
PFDoA-RPD = 1.6%

EAFB03-SD-001-001 MS/MSD
8/15@01:45/01:58
MS = 91-112%
MSD = 87-115%
RPD = 0-12%
PFDS MS = 23.3/22.0 = 105.9%
PFDS MSD = 23.8/21.7 = 106.7%
PFDS RPD = 0.5/23.55 = 2.1%

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

VIII.	Laboratory Control Sample (LCS)			
	1. Were LCS samples run at correct frequency for each matrix samples?	Yes	No	N/A
	2. Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?	Yes	No	N/A
	4. Were any qualifications required based on LCS data in conjunction with other QC information?	Yes	No	N/A
	Comments/Qualifications: **LCS 280-237985/2-A 8/14@18:10: 90.0-111%** **PFHxA** = 18.719.5 = 95.9% **LCS 280-237986/2-A 8/15@00:32: 92.0-112%** **PFPA** = 19.1/19.6 = 97.4%			

IX.	Internal Standards			
	1. Were standard area counts within a factor of -36% to +130%, and -60 to +155% from associated calibration standard?	Yes	No	N/A
	2. Were retention times of internal standard within + or - 30 seconds of retention time of associated calibration check?	Yes	No	N/A
	3. Were any qualifications required based on internal standard results?	Yes	No	N/A

Comments/

Low area count recoveries for:

EAFB03-SB-001-001---Perfluorooctanoic Sulfonate—"J".

EAFB03-SB-001-001, EAFB03-SB-004-010--- Perfluorononanoic acid---"UJ/J".

EAFB03-SB-001-001DL, EAFB03-SB-004-010DL—all compounds.---"J".

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

X/XI. Compound Identification/Quantification and Reported Contract Required Quantification Limits (CRQLs)			
1. Were sample results correctly calculated and reported by laboratory?	Yes	No	N/A
2 Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	Yes	No	N/A
3. Were CRQLs adjusted to reflect sample dilutions and dry weight factors not accounted for by the method? Percent moisture >70% moisture< 90%: nondetects-UJ detects-J. Moisture> 90% then nondetects-R detects-J.	Yes	No	N/A
4. Were any laboratory QA/QC sample results calculated from peaks derived using manual integration?	Yes	No	N/A
5. Were any qualifications required based on this information?	Yes	No	N/A

Comments/Qualifications:

No raw data review---level III

XII. Field QC			
1. Were any Field Duplicates associated with this SDG?	Yes	No	N/A
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	Yes	No	N/A
2. Were any field blanks or equipment rinsates associated with this SDG?	Yes	No	N/A
a. If yes, were any compounds reported in samples >IDL?	Yes	No	N/A
b. Were any qualifications required based on this information?	Yes	No	N/A

Comments/Qualifications:

EAFB01-SB-001-002/ EAFB01-SB-001-002
Both samples at non-detects.

EAFB01-SB-001-001/ EAFB01-SB-001-901			RPD
0.80	Perfluorooctanoic acid	0.40	66.7%

EAFB03-SD-001-001—***the field dup cancelled by client***

DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS

Reviewer: Kitchings **Date:** 9/6

Project: Eielson AFB **SDG:** 280-58523-1 **Matrix/No. Samples:** Soil-24, Sed-1

XIII. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	**Yes**	No	**N/A**
Comments/Qualifications:			

Appendix E

Investigation-Derived Waste Manifest

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-919-AK23091(NM)

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE

GENERATOR

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. AK1570028646	Manifest Document No. 23091A	2. Page 1 of 1

3. Generator's Name and Mailing Address
USAF EIELSON AFB
2310 CENTRAL AVE, SUITE 100
EIELSON AFB, AK 99702

Site Address
USAF EIELSON AFB
2310 CENTRAL AVE, SUITE 100
EIELSON AFB, AK 99702

4. Generator's Phone ((907) 377-2574

5. Transporter 1 Company Name	6. US EPA ID Number	A. State Transporter's ID
EMERALD ALASKA, INC	AKR000004184	B. Transporter 1 Phone (907) 258-1558
7. Transporter 2 Company Name	8. US EPA ID Number	C. State Transporter's ID
		D. Transporter 2 Phone

9. Designated Facility Name and Site Address	10. US EPA ID Number	E. State Facility's ID
EMERALD ALASKA, INC. 2020 VIKING DRIVE ANCHORAGE, AK 99501	AKR000004184	F. Facility's Phone (907) 258-1558

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	1	DM	90	P
b. MATERIAL NOT REGULATED BY D.O.T.	1	DM	120	P
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) EA0302 IDW DECON WATER, 55DM
2) EA0705 NON-RCRA AND/OR PETROLEUM CONTAMINATED SOIL/SAND/GRAVE

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

16. **GENERATOR'S CERTIFICATION:** I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name	Signature	Date Month	Day	Year
Randall Ac Smith	Randall Ac Smith	09	24	14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Ian Combs		09	24	14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month	Day	Year